February, 1957

SOAP and CHEMICAL SPECIALTIES

In this issue...

European market push synthetic detergents

• • • •

proved aerosol solvent in methyl chloroform

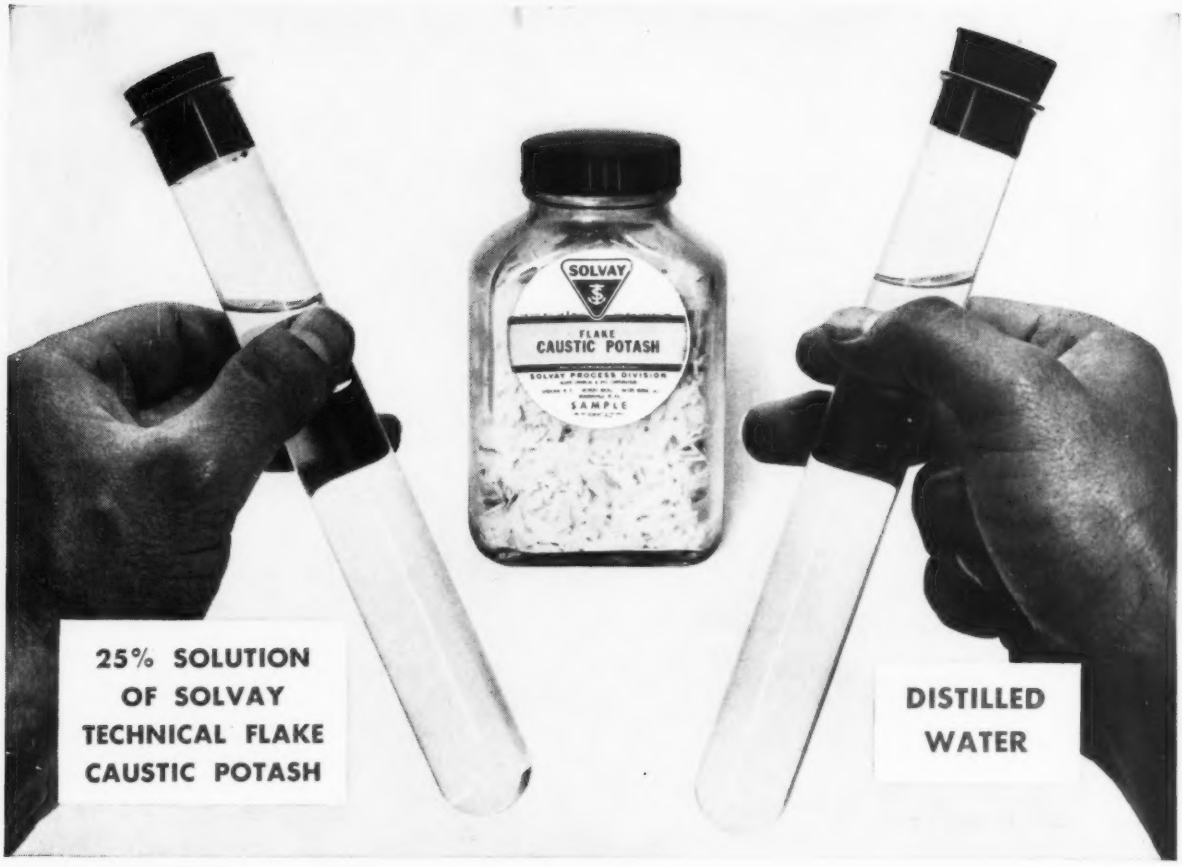
• • • •

w pyrethrins synergist ows up strong in tests

• • • •

hat's new in automotive tifreeze formulations?

William McChesney Martin, Jr., board chairman of the Federal Reserve System, addresses 30th annual meeting of soap industry. E. B. Osborn, head of Economics Laboratory, Inc., reelected president of Soap Assn., looking on.



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Editor

Associate Editor
CHARLOTTE HAAS

Advertising Manager
THOMAS MORGAN

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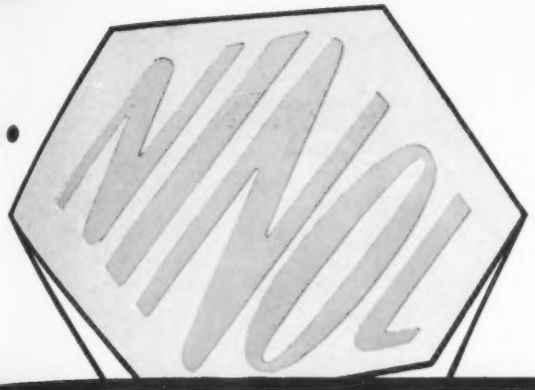

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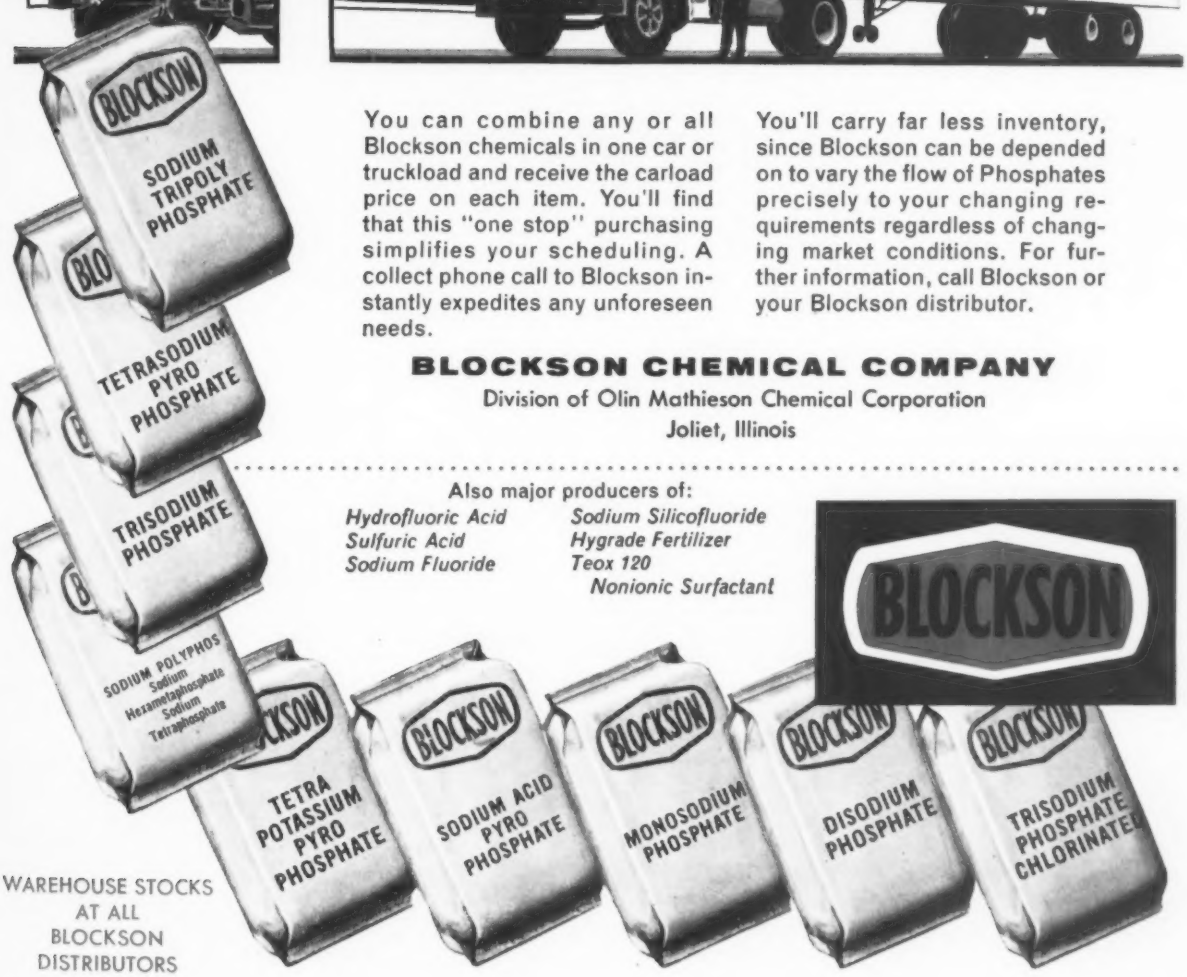

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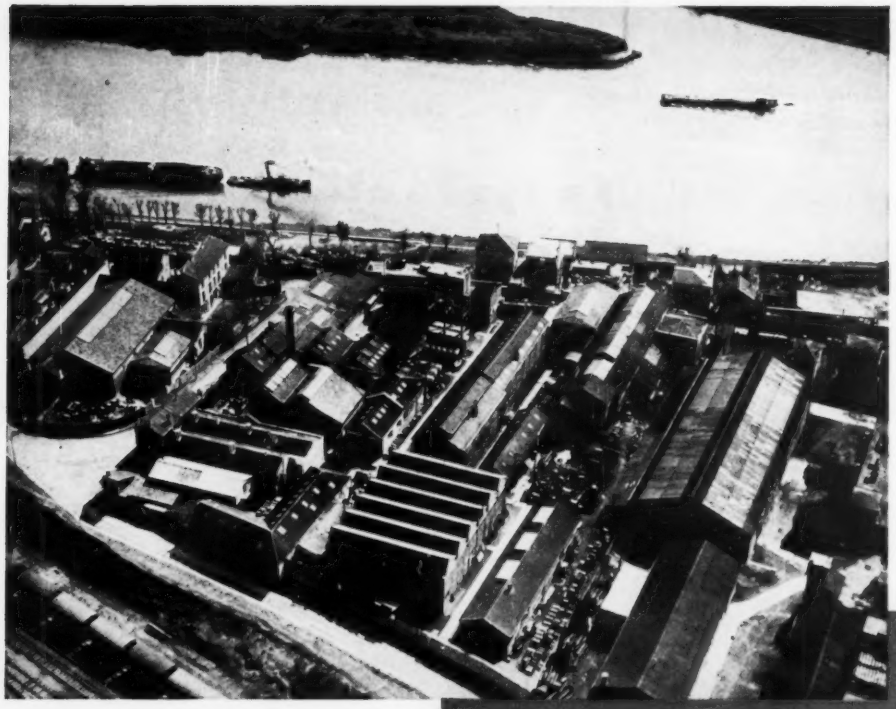

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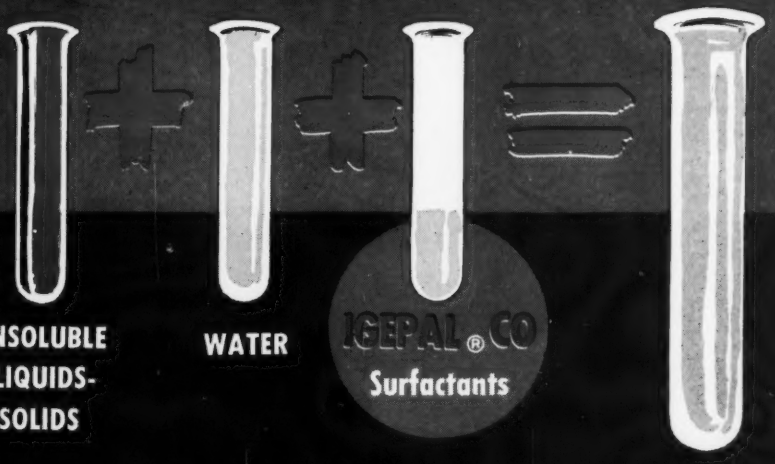

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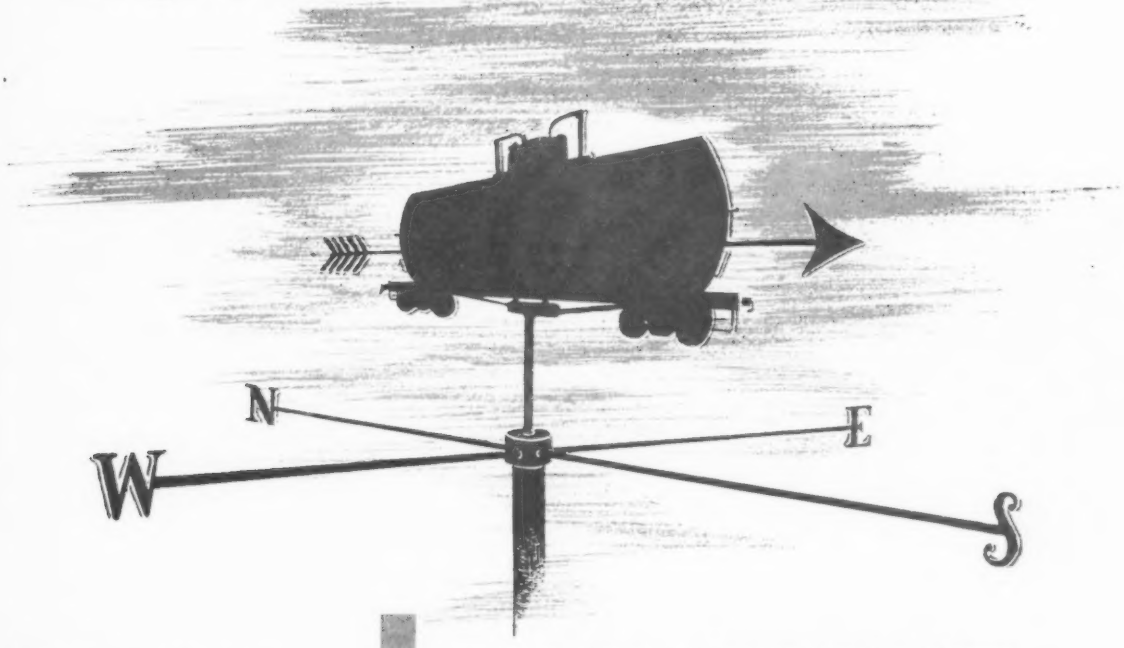

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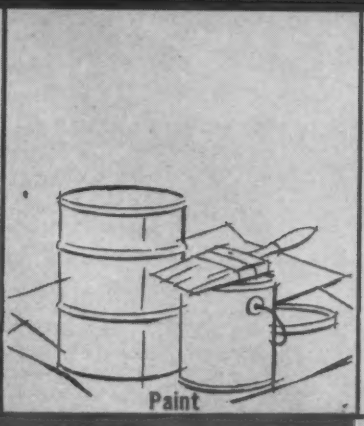

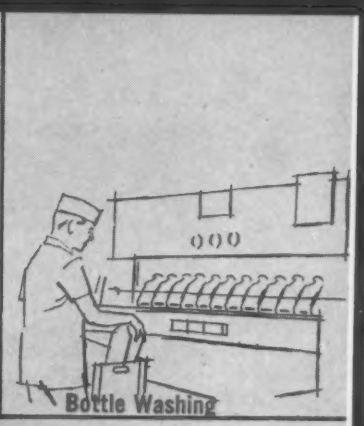

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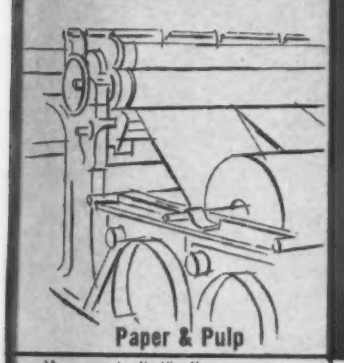

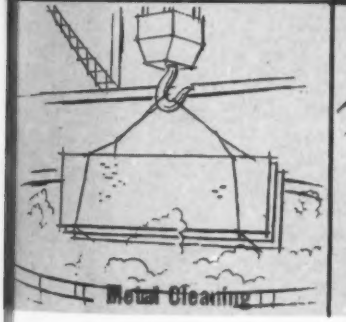

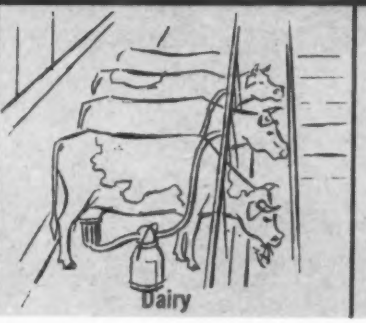

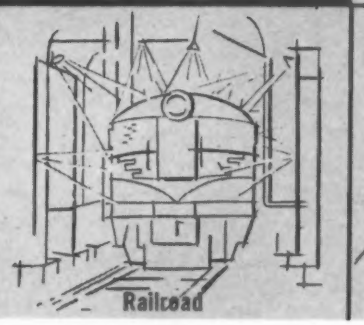

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***NANSA LIQUIDS**

built alkyl aryl sodium sulphonate liquids

***NANSA U.C. POWDER**

bead type totally spray dried synthetic detergent containing molecularly condensed phosphates, carboxy-methyl-cellulose, silicates, foam builders etc.

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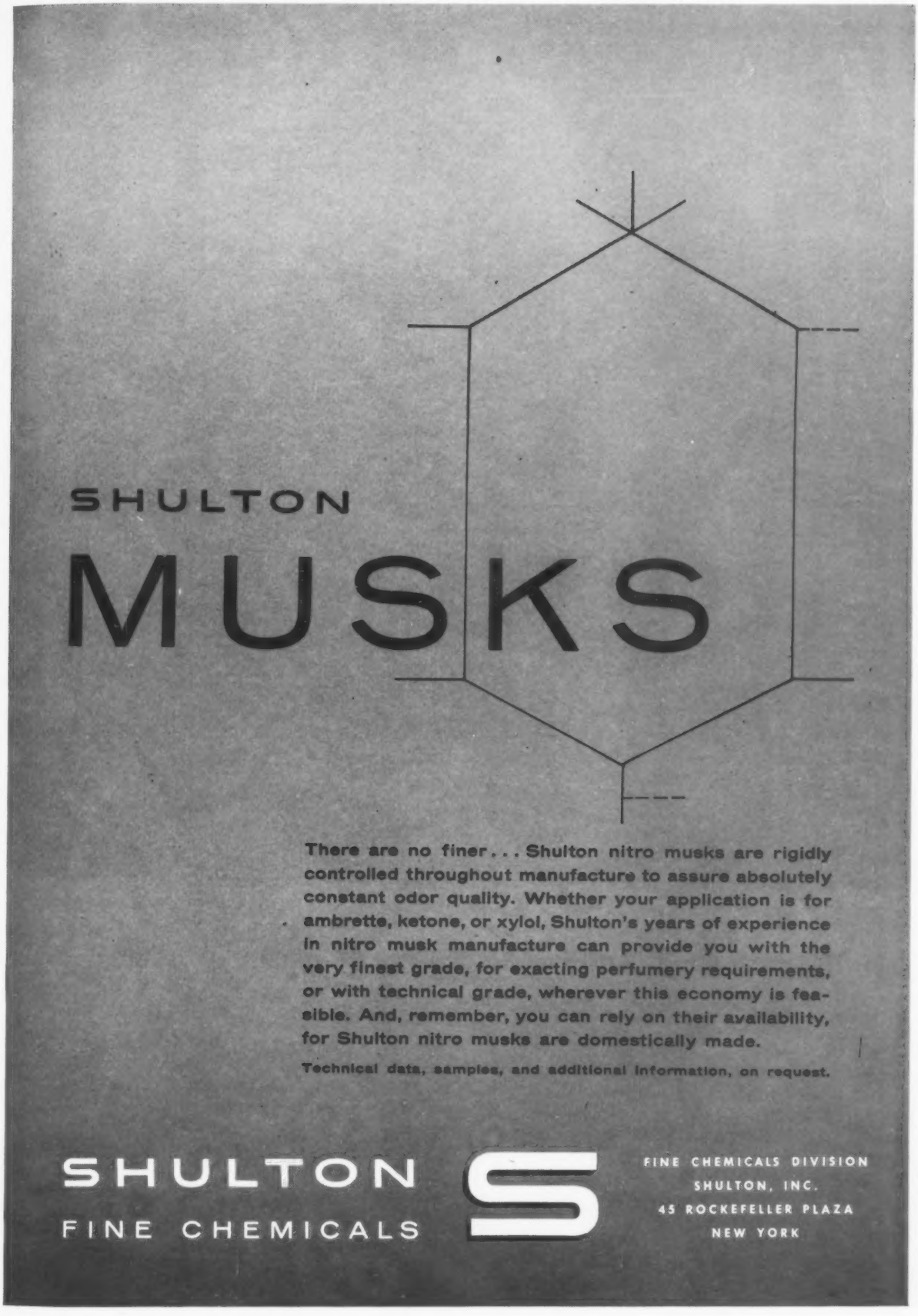
INORGANIC DIVISION: phosphoric acid and complex phosphates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(He's a deck officer on the Marine Dow-Chem)

After a few terse commands from the bridge, the 18,000-ton *Marine Dow-Chem* glides silently into the night. With her cargo of vital chemicals the *Dow-Chem* plies her way to key Dow terminals. In her storage tanks there is enough caustic soda to fill 175 tank cars.

Typical of the foresighted Dow attitude of solving a problem before it arises, the *Dow-Chem* was commissioned in 1954 with an eye to the future needs of industry. Today, this specially equipped ship is an important part of our vast distribution system.

As demand increases, Dow will continue to lead the way in developing new methods to deliver caustic soda to your doorstep in any form or quantity. THE DOW CHEMICAL COMPANY, Midland, Mich., Dept. AL 600G.

YOU CAN DEPEND ON DOW

After Closing

Hollingshead Head Resigns

Wilbur H. Norton has resigned as president of R. M. Hollingshead Corp., Camden, N.J., effective May 31, it was announced earlier this month. No successor has as yet been named. Mr. Norton has served as Hollingshead president since April, 1952.

★

Frank E. Huckins Dies

Frank E. Huckins, 66, who at his retirement last fall was in charge of specialty sales in the midwest central district for Sinclair Refining Co., New York, died following a heart attack at his home in Calico Rock, Ark., Jan. 24. Mr. Huckins, who specialized in the sale of insecticides and other chemical specialties for Sinclair, joined the company in the early Thirties. Previously he had been sales manager for Rex Research Corp., Toledo, where he promoted the firm's "Fly-Tox" insecticide.

Since his retirement, Mr. Huckins has raised Black Angus cattle on his farm in Calico Rock.

★

C-P Elects Brandi

Election of Frederic H. Brandi to the executive committee of Colgate-Palmolive Co., New York, was announced last month by Edward H. Little, chairman. Mr. Brandi is president of Dillon, Reed & Co., New York. He has been a director of Colgate-Palmolive since 1954.

★

NPCA Names Showalter

Robert L. Showalter has been appointed executive assistant of the National Pest Control association, it was announced last month by Myron W. Smith, president. Mr. Showalter is also executive secretary of the Texas Pest Control Association.

Mr. Showalter, who operates his own pest control firm in Abilene, Tex., has been active in the TPCA for almost ten years. He served as secretary of the association in 1951 and 1952 and as president in 1953. He was elected executive secretary the following year.

Robert L. Showalter

★

Packer Machinery Moves

Packer Machinery Corp., manufacturer of liquid filling equipment, has moved to a newly-constructed plant at 109 14th St., Brooklyn 15, N. Y., it was announced recently by Bernard Misbin, president. The company was formerly located at 30 Irving Pl., New York 3.

★

Hickey to Rhodia

Michael J. Hickey has joined Rhodia, Inc., New York, as perfumer at the firm's New Brunswick, N. J., plant. Mr. Hickey's appointment became effective January 22. He comes to Rhodia from Florasynth Laboratories, Inc., Bronx, N. Y., where he had served as technical director of the perfume division.

Prior to joining Florasynth Mr. Hickey was associated with William J. Stange, Chicago; E. I. du Pont de Nemours & Co., Wilmington, Del.; and Fritzsche Brothers, Inc., New York. He is a graduate of Manhattan College and Fordham University and has done graduate work at Massachusetts Institute of Technology.

★

Conn. Plans Poison Center

An act establishing a "State Poison Information Center" was introduced last month in the Connecticut legislature. Appropriation of $38,200 is called for to implement the proposal. Within the state department of health a poison information center is to be established to which hospitals and physicians can refer for information on the ingredients of substances which are potentially poisonous, their physiological effects and symptoms and signs of toxic reactions and specific antidotes, if any. The center will promote establishment of sub-information centers at selected places in the state. It will supply these sub-centers with up-to-date information which can be disseminated locally upon request.

The state poison information center will utilize information at its command including reported poison cases to reduce frequency of occurrence of accidental poisoning.

★

Treplow Acquires New Site

Treplow Products, Inc., Paterson, N. J., recently acquired a 34-acre plot in Goshen, N. Y., it was announced last month. The firm plans to build a detergent plant on this site to supplement production of items made at the Paterson plant and possibly to make new products. The executive office and plant at Paterson will continue.

Treplow makes a wide range of surfactants under the trade name "Trepolate," "Trepenol" and "Trepoline."

★

New Armour Publication

Armour and Co., Chicago, recently announced a new quarterly publication designed to cover the latest developments in its chemical division. According to Karl M. Bierman, market development manager, the new, eight-page, paper bound booklet is devoted mainly to

the division's research activities on new chemicals or new applications for existing products. The first issue, which was published last month, contains articles on oleyl amines, alpha-sulfoalkyl acids and ethochemicals. Copies of the publication may be obtained from the Armour chemical division, market development department, 1335 West 31st St., Chicago 9.

—★—

Aerosol Filling Exhibit

To illustrate the simplicity of aerosol filling, Mojonnier Associates, Inc., Franklin Park, Ill., will operate a complete filling line at the National Packaging Exposition and Conference to be held at the International Amphitheatre, Chicago, Apr. 8-11. The line will fill two types of new bottles which are made with du Pont's new "Zytel" nylon resin; four ounce, blow molded "Boston Round" aerosol bottles, furnished by the plastics division of Continental Can Co., New York, and a 3½ ounce, two-piece, two-color injection molded design furnished by National Plastics Co., Odenton, Md.

The Mojonnier exhibit will also coordinate the materials of many aerosol suppliers to produce a finished product, including "Zytel" resin by du Pont; "Freon" propellant by du Pont; blow molding by Continental Can Co.; injection molding by National Plastics Co.; cologne by Fluid Chemical Co.; valves and overcaps by Risdon Mfg. Co.; and filling by Mojonnier.

A new Mojonnier rotary filler capable of filling speeds up to 600 four ounce units per minute will also be shown. An automatic weight control and recording system is to be featured also at the Mojonnier booth.

—★—

Cos. Chems. Hear Dutcher

A discussion of the potential uses of antibiotics in cosmetics by James Dutcher of Squibb Institute of Therapeutic Research, was the highlight of the Jan. 23 meeting of the New York Chapter of the Society of Cosmetic Chemists held at the Brass Rail Restaurant. The title of Dr. Dutcher's speech was "Recent Chemical Studies of Antifungal and Other Antibiotics."

Newly elected officers and committee chairmen of the New York Chapter of the Society of Cosmetic Chemists: Top, officers, Vincent DeFeo, Dodge & Olcott, treasurer; William Lambert, American Perfumer, ex-officio; Warren Dennis, Shulton, Inc., chairman, Miss Marie Wiener, Fluid Chemical Co., secretary and Harry Isacoff, van Ameringen-Haebler, Inc., chairman-elect. Lower photo, committee chairmen: Standing, Irving Schlakman, Nysco Labs., house; John Longfellow, Colgate-Palmolive Co., hospitality; Martin Rieger, Lambert-Hudnut, membership; Martin Katz, Revlon, program; seated, Michael Stanton, Stanton Sales, interprofessional relations; Irving Colbert, Malmstrom, entertainment and James Lamb, Dodge & Olcott, publicity.

The chapter recently installed new officers including: Warren B. Dennis, Jr., Shulton, Inc., Clifton, N. J., chairman; Harry Isacoff, van Ameringen-Haebler, Inc., New York, chairman-elect; Vincent Defeo, Dodge & Olcott, Inc., New York, treasurer; and Maria Wiener, Fluid Chemical Co., Newark, N. J., secretary.

—★—

New "Pres-O" Valve

Oil Equipment Laboratories, Inc., Elizabeth, N. J., has redesigned its No. 500 series "Pres-O" aerosol valve, it was announced recently. The new valve is said to handle any type spray from fine cosmetic to heavy insecticide and is adaptable to any aerosol container. Valve action controls the rate of flow from 3/10 to one gram per second. Further information may be obtained from the company, 600 Pearl St., Elizabeth, N. J.

—★—

P&G "Dividend Day"

Employees of Procter & Gamble Co. in the Cincinnati area celebrated the first of a series of company-wide "Dividend Day" meetings, in that city, Jan. 19. The meetings mark the 70th anniversary of the firm's profit sharing plan which boasts an unbroken annual dividend record. P&G plans have paid or credited to employees a total of about $94,000,000 since the first plan was introduced in 1887. During the past year, some 14,000 P&G employees in profit sharing plans were paid or credited with a record $10,000,000.

Maint. Show Oct. 14-16

Preliminary plans were announced recently for the second annual Sanitation Maintenance Show and Conference to be held at Navy Pier, Chicago, Oct. 14-16. The show was held for the first time last October in New York. It drew more than 3,500 sanitation maintenance executives and 86 exhibitors.

Some of the products and supplies listed for exhibit include detergents, disinfectants, dishwashing compounds, floor seals and waxes, liquid soaps, insecticides and wax polishes. There will also be a series of conferences on sanitation maintenance problems under the chairmanship of J. Lloyd Barron, manager of the sanitation department of National Biscuit Co.

The show will be sponsored by the Industrial Sanitation Management Association, the Association of Food Industry Sanitarians, and the National Association of Bakery Sanitarians.

—★—

New Stepan Surfactant

Stepan Chemical Co., Chicago, recently announced a new non-ionic surfactant called "Makon 10." The product, which is a nonyl phenoxy polyoxyethylene ethanol is said to offer excellent detergency, foaming, dispersing, emulsifying and solubilizing action. It can be used with anionic, cationic or nonionic agents in either hard or soft water. Further information and samples can be obtained on request to the company, 20 North Wacker Drive, Chicago 6.

—★—

More Soap Foil Wraps

The soap industry appears to offer a growing potential for gravure packaging materials, according to *Gravure* magazine, Garden City, N. Y. "Camay" toilet soap, made by Procter & Gamble Co., Cincinnati, recently became the third major soap to shift to a gravure printed foil wrapper. The new "Camay" wrap has an overall pearl pink tone, and is printed by McDonald Printing Co., Cincinnati, and Specialty Papers Co., Dayton, O., the article in the January, 1957 issue of *Gravure*, says.

A new foil wrap for "Woodbury" soap, made by Andrew Jergens Co., Cincinnati, appeared recently. It too is printed by gravure. The first major soap to appear in gravure printed foil wrap was "Lux" toilet soap of Lever Brothers Co., New York. The new "Lux" wrap, introduced last year, is printed by Reynolds Co., Louisville. The "Lux" wrap won an award in the National Flexible Packaging Competition, 1956. The most recent addition to Lever's line, "Gayla" transparent soap, also has a foil wrap.

—★—

AOCS Meets in April

Ralph M. Persell, Southern Regional Research Laboratory, New Orleans, has been elected general chairman of the 48th annual meeting of the American Oil Chemists' Society, it was announced last month by T. H. Hopper, AOCS president. The meeting will be held at the Roosevelt Hotel, New Orleans, April 29 to May 1. R. T. O'Connor, also of SRRL, has been named program chairman. Preliminary plans call for two symposia of invited papers and six sessions of general papers.

—★—

Rohm & Haas Names Two

Appointment of Arthur L. Blount, a vice-president, as manager of its Philadelphia plant, was announced recently by Rohm & Haas Co., Philadelphia. Mr. Blount succeeds C. E. Andrews, also a vice-president, who has retired. Mr. Andrews served as plant manager since 1941. Paul D. Grubb was named assistant plant manager and production manager.

Mr. Blount joined Rohm & Haas in 1940. He served as assistant manager of the Philadelphia plant since 1948. Prior to that time, he was assistant plant manager of resinous operations. He became a vice-president in 1947. Mr. Grubb joined the company in 1937. He was named plant superintendent in 1948 and production manager in 1955.

States' Poisons Laws

New economic poisons and hazardous substances laws are now being considered in various state legislatures. Labeling regulations covering carbon tetrachloride, methyl bromide, tetrachloroethane, and other hazardous substances will become effective in Massachusetts May 1, 1957. The regulations under an Act passed in 1955 have just been published. For further information address Commissioner Ernest A. Johnson, Department of Labor and Industries, Commonwealth of Massachusetts, State House, Boston, Mass.

An economic poisons bill was introduced in the Assembly of Maryland on Jan. 21, 1957. Entitled "Inspections—Insecticides and Fungicides", the proposed bill closely follows the Model Bill, according to CSMA. An "optional" labeling clause is included and registration is required. Registration fees are $7.50 per brand up to $75.00 and $3.00 per brand thereafter.

In Pennsylvania a bill is pending, entitled "Insecticide, Fungicide and Rodenticide Act of 1957". It pertains to the above and other pesticides, follows a pattern similar to the bill introduced in Maryland. However, it should be noted that part of the optional labeling provisions do not apply to products for agricultural use. Registration fee is $7.50 per brand for the first ten brands and $2.00 per brand for each brand thereafter. CSMA counsel feels that the addition of a new section is indicated, which would give the Secretary of Agriculture exclusive jurisdiction over the sale and distribution of pesticides in the commonwealth of Pennsylvania. The purpose of such an amendment is the prevention of possible conflicts with other laws such as pharmacy laws which may also regulate the labeling of some poisons.

In Utah a bill is pending which 'Provides sales of sprays and insecticides for the control of insects, pests, and diseases in commercial production of fruits, vegetables,

and animal products shall be deemed a wholesale sale and exempt from taxation."

CSMA urges its members to review these bills and to inform the association of any criticism or action recommended.

—★—

DDT Fed to Volunteers

"The Effect of Known Repeated Oral Doses of Chlorophenothane (DDT) in Man", by Dr. Wayland J. Hayes, Jr., M.D.; Dr. William F. Durham, and Cipriano Cueto, Jr., Savannah, Ga., is available in reprint form from the Chemical Specialties Manufacturers Association, it was announced last month. The paper appeared originally in the *Journal of the American Medical Association*, Oct. 27, 1956.

The report covers experimental work carried out by the U. S. Public Health Service with 51 human volunteers. One third of these men received 35 mg of DDT per man per day, which is about 200 times the daily rate at which an average man receives DDT from his normal diet. One third received no DDT except that in the ordinary diet. One third received 3.5 mg per man per day. During the entire study no volunteer complained of any symptom or showed, by the tests used, any sign of illness that did not have an easily recognized cause clearly unrelated to exposure to DDT.

A method of determining concentration of DDA (bis (p-chlorophenyl acetate acid) in urine was developed during the tests.

Results indicate that a large safety factor exists considering possible daily intake of DDT as it now occurs in the general diet.

—★—

Continental Earnings Up

Net income and share earnings of Continental Oil Co., New York, increased to $51,800,000 and $5.30, in 1956, according to an estimate made recently by L. F. McCollum, president. This compares with a net income of $46,400,000 and share earnings equal to $4.75, the previous year.

Fordham Honors Lodes

Fred J. Lodes, president of Lodes Aerosol Consultants, Inc., New York, was honored at the

Fred J. Lodes

103rd annual dinner of the Fordham College Alumni Association, held at the Biltmore Hotel, New York, on February 11. Mr. Lodes, chosen "science man of the year" among Fordham alumni, was awarded a scroll by the president of Fordham, The Very Rev. Laurence J. McGinley, S.J., for his work in aerosol research and development. Dr. George A. Brenner, president of the Alumni Association presided at the dinner. Mr. Lodes was a member of the class of 1938 at Fordham. Each year the Association presents an award in various categories to prominent alumni.

—★—

Pennsalt Names Bixby

Arthur F. Bixby has been named marketing research manager of the industrial division of Pennsylvania Salt Manufacturing Co., Philadelphia, it was announced recently by George R. Lawson, marketing director. In his new assignment, Mr. Bixby will supervise product managers and direct market development of the company's heavy chemicals and "Sharples" brand specialties. Mr. Bixby formerly was general manager of agricultural chemicals for Pennsalt's western division at Tacoma, Wash. He joined the company in 1938 as assistant director of heavy chemicals.

New Calcasieu Plant

Calcasieu Chemical Corp., New Orleans, will build an $11,000,000 petrochemical plant for the production of ethylene oxide, ethylene glycol and other petrochemical compounds, it was announced recently. The new plant will be built and operated for Calcasieu by Petroleum Chemicals, Inc., also of New Orleans. Current plans call for the completion of the structure in early 1958. The new unit will have an annual production capacity of 8,000,000 gallons. Calcasieu Chemical is owned by Mineral Solvents Co., Chicago, Sears, Roebuck & Co., Cities Service Co. and Continental Oil Co.

—★—

E. T. Doyle Dies

E. T. Doyle, western district sales manager of Diamond Black Leaf Co., Cleveland, died Dec. 21 at Burlingame, Calif., after a short illness. Mr. Doyle joined Diamond in March, 1955 after 33 years as western sales representative for the former Black Leaf Division of Virginia-Carolina Chemical Corporation, Richmond, Va. He was founder and organizer of the Western Agricultural Chemicals Association.

—★—

Swift Appoints Bogdanoff

Appointment of B. John Bogdanoff as New York state sales representative for the industrial oil department of Swift & Co., Hammond, Ind., was announced recently by Fred Beneker, general sales manager. In his new assignment, Mr. Bogdanoff will represent Swift's line of fatty acids and industrial oils throughout New York state with the exception of the New York metropolitan area. He formerly had been with the firm's research laboratory.

—★—

Givaudan-Canada Relocates

Givaudan-Canada, Ltd., has moved to new and enlarged offices at 214 Merton St., Toronto 7, Ontario, Canada, it was announced recently. The firm is a Canadian affiliate of Givaudan-Delawanna, Inc., New York.

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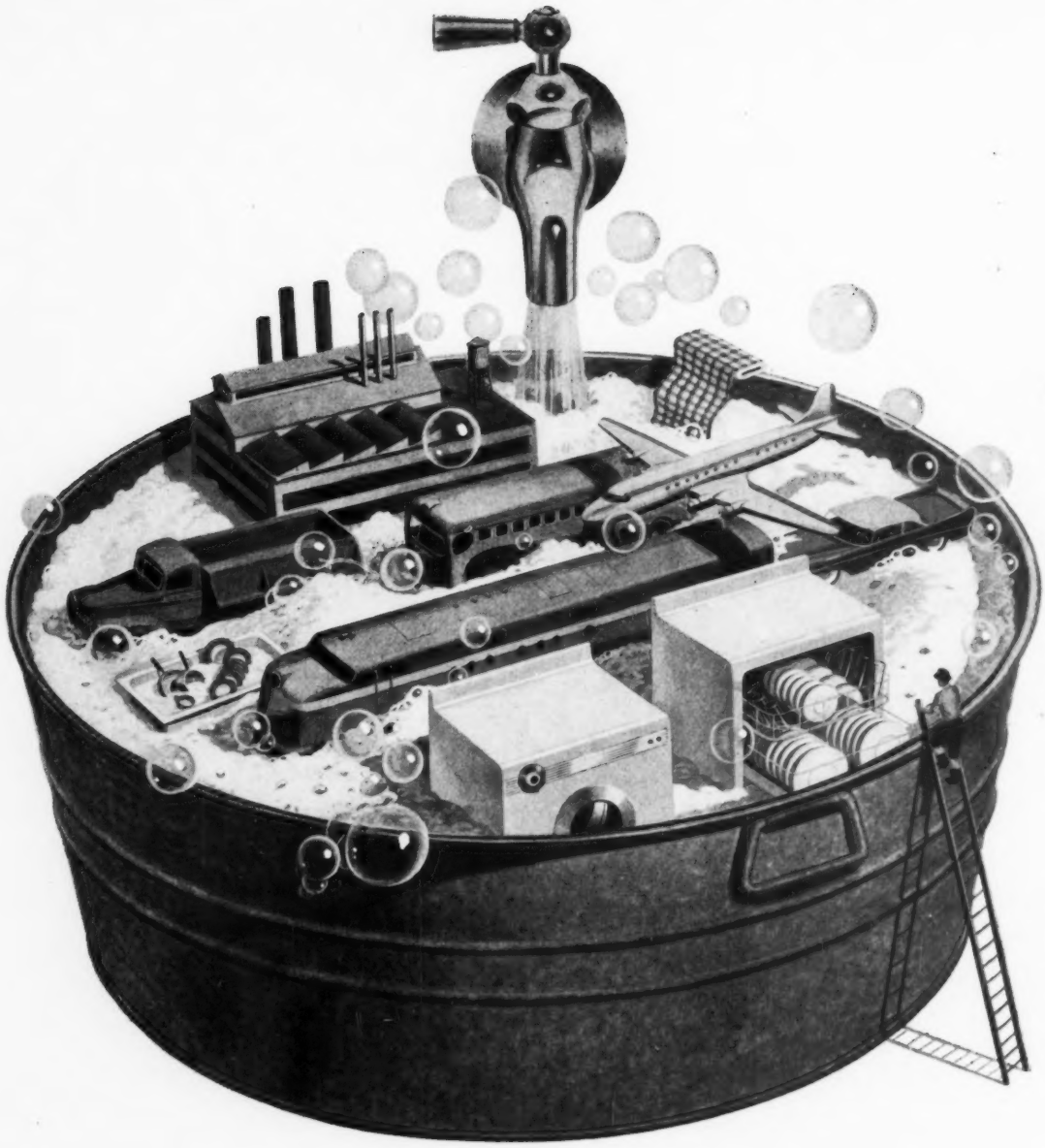

In just 10 years

with Oronite ALKANE*—a 2,000 year custom has been washed away

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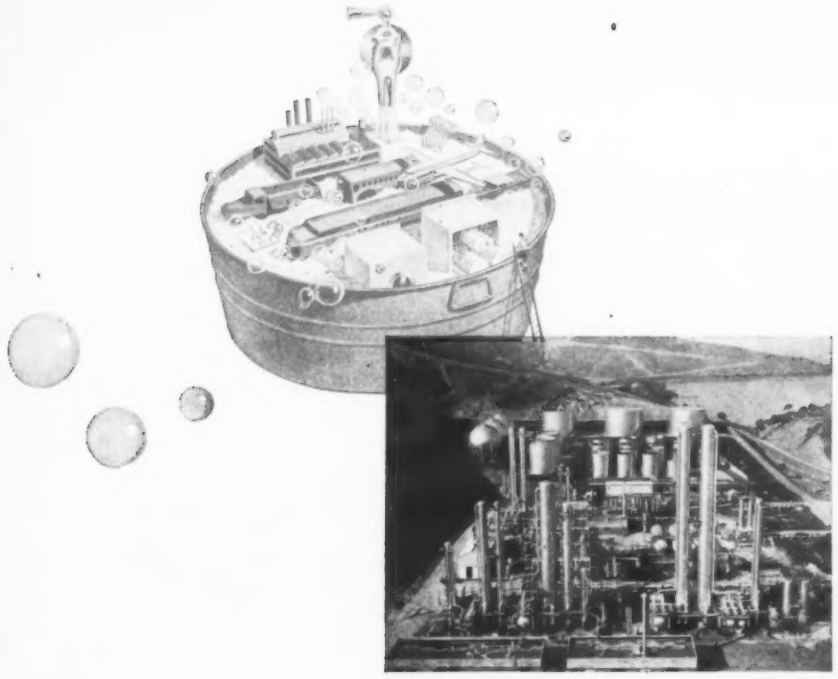

A section of the large commercial facilities for the manufacture of Oronite ALKANE—the world's leading detergent raw material.

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Marketing the leading detergent raw material also brings a responsibility to the future. As in the past, millions of dollars are being invested in research and manufacturing facilities to assure that "you can expect from Oronite, whatever is new or better in detergent raw materials."

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STEPAN makon 10

SPECIFICATIONS

Physical State:	Clear viscous liquid
Color:	Pale yellow to colorless
Cloud Point of 1% Solution in Water:	52°—56°C
pH (1% solution):	Neutral
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Flash Point (°C):	290°
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Density:	8.85 lbs. per gallon
Specific Gravity (25°C):	1.06

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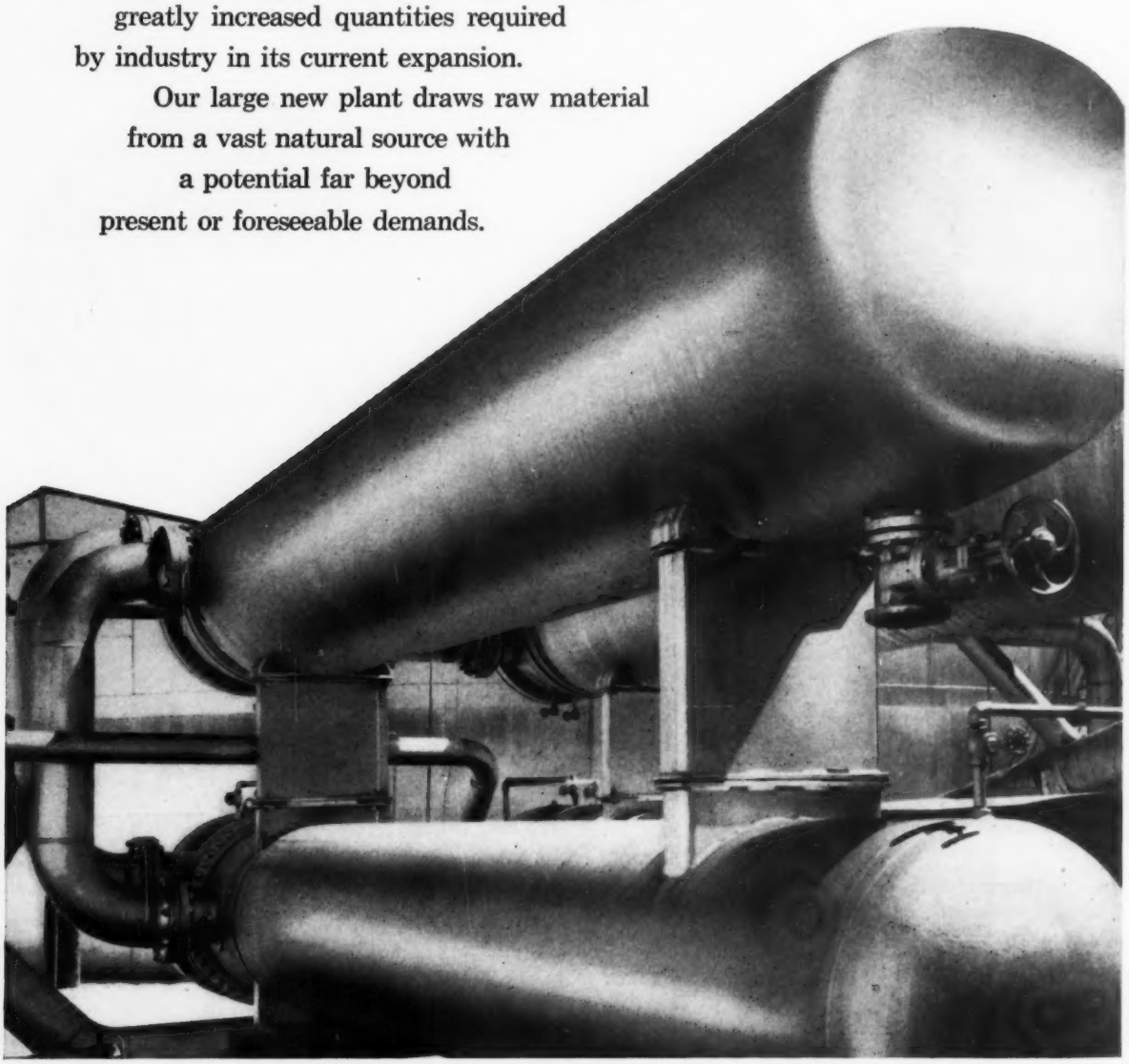

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ALBERT VERLEY AND COMPANY

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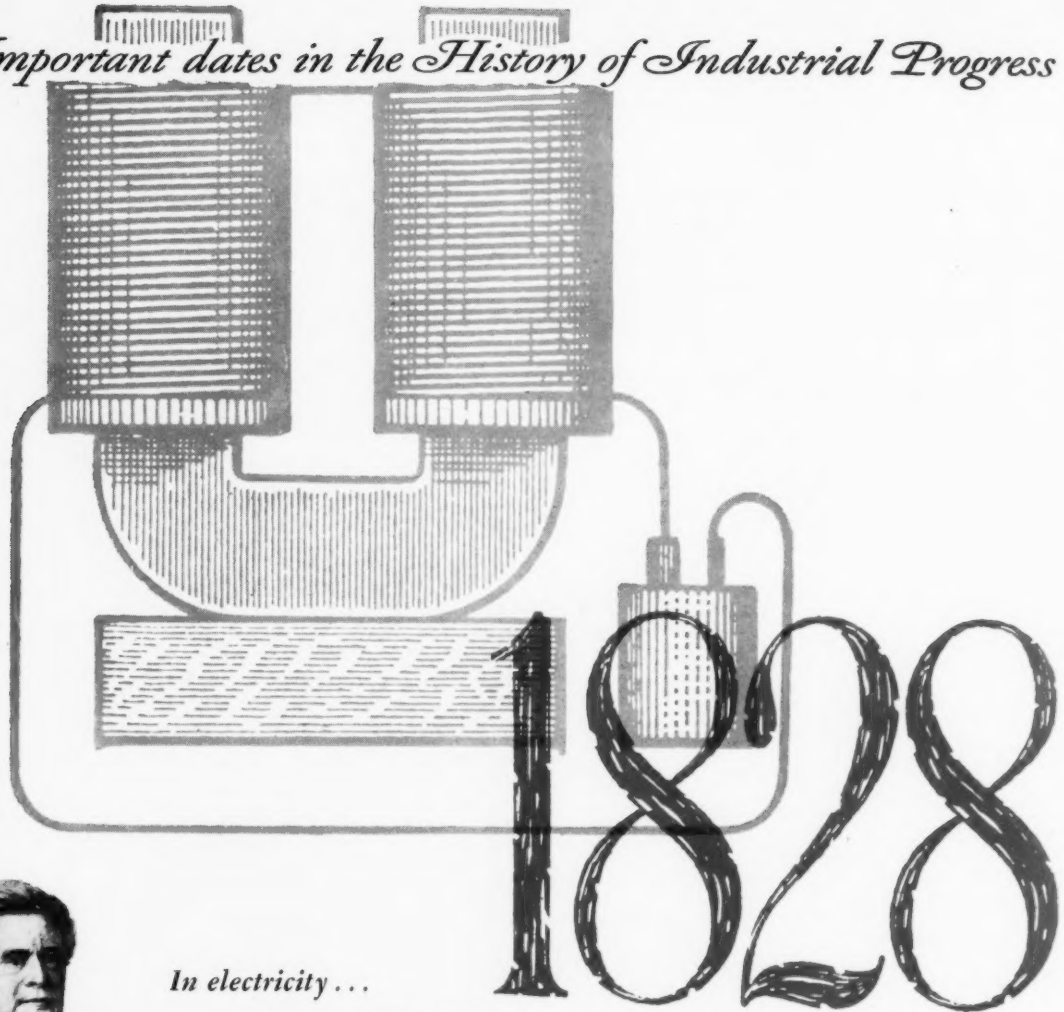

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American scientist Joseph Henry demonstrated the first electromagnet. He was the first to produce acoustic signals at a distance by this forerunner of Morse's telegraph.

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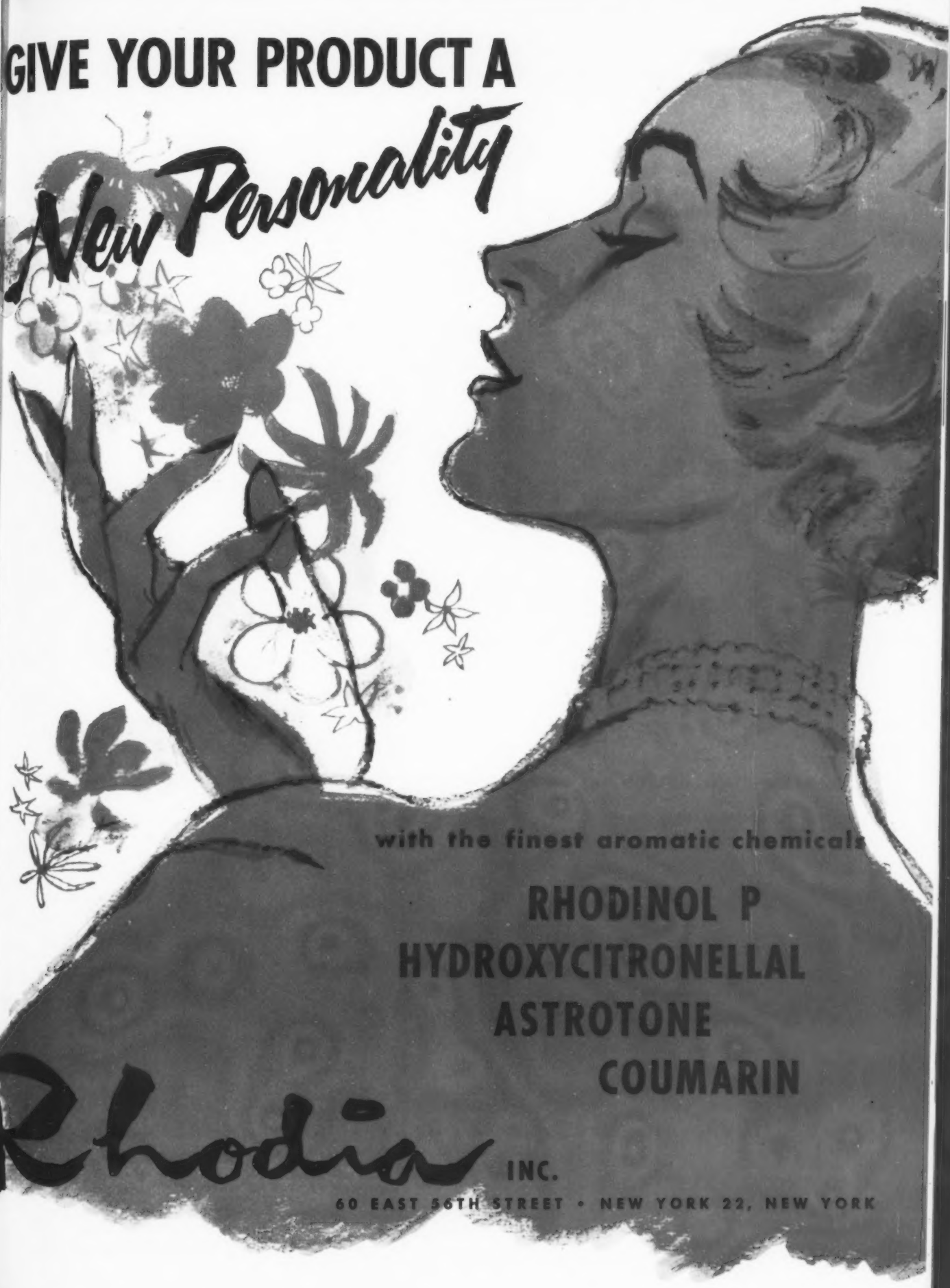

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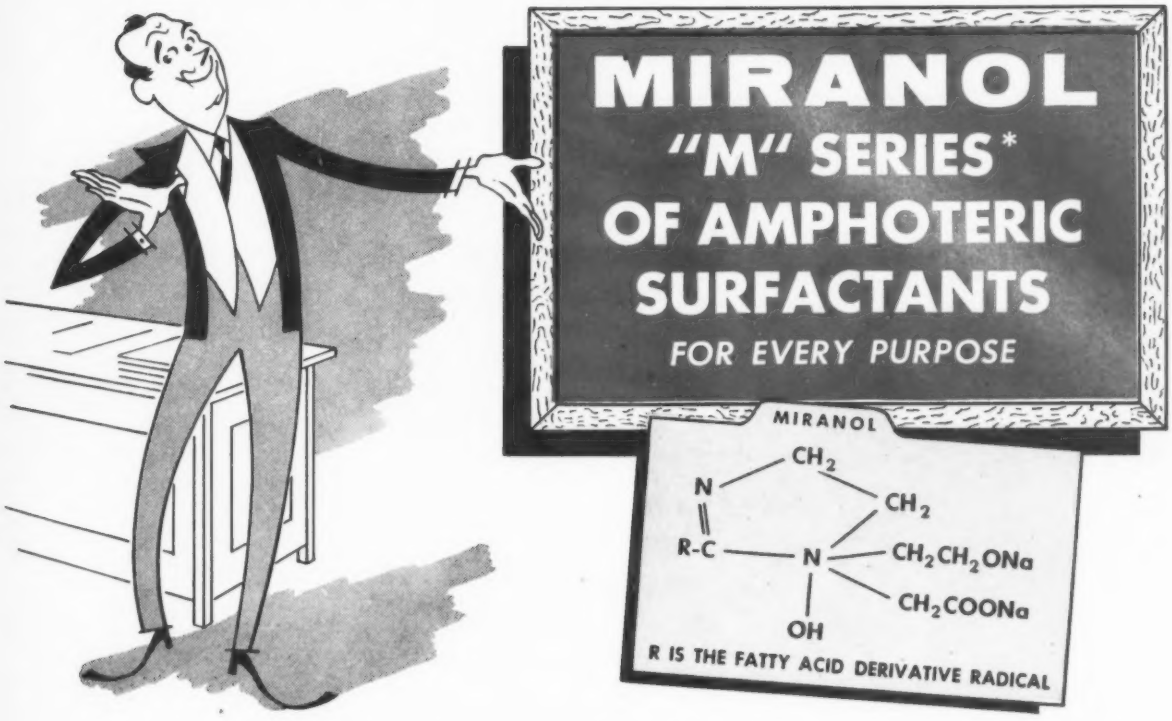

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by E. G. Thomssen and John W. McCutcheon

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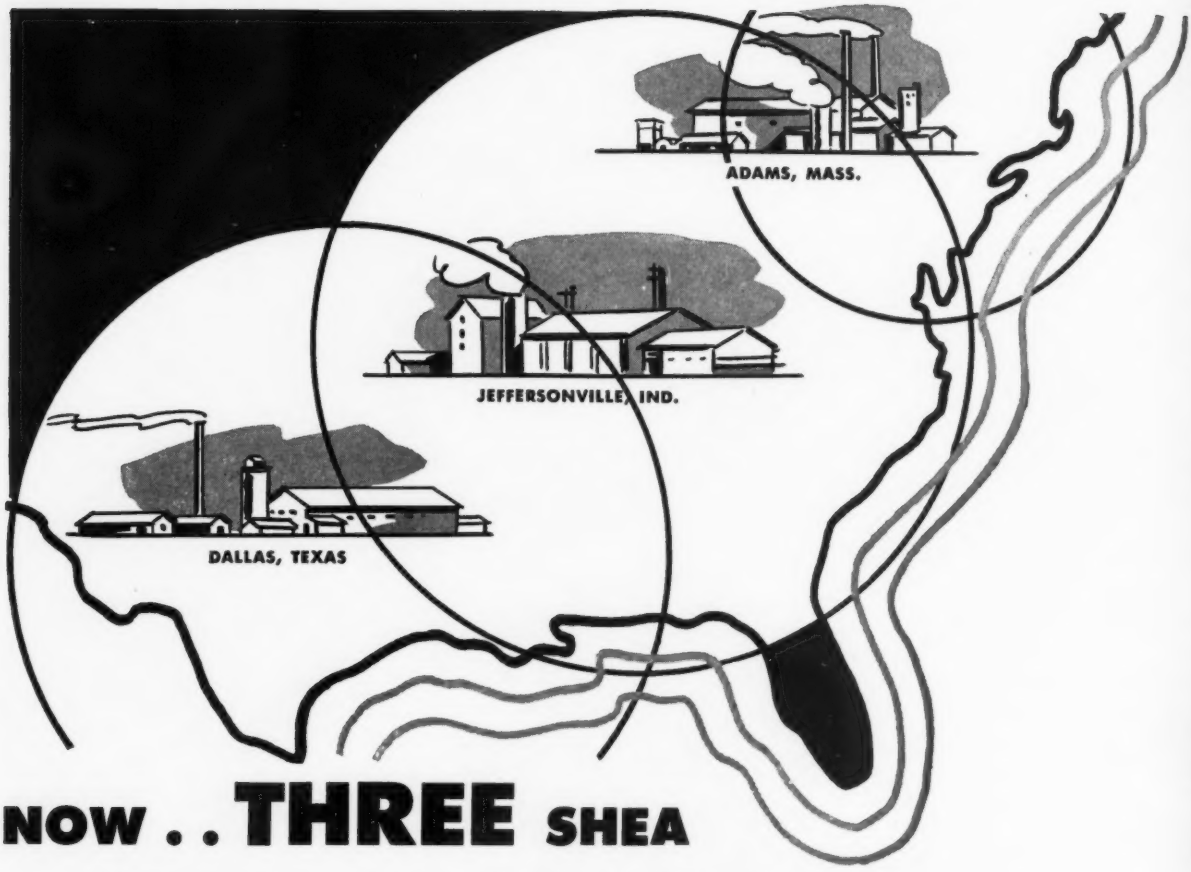

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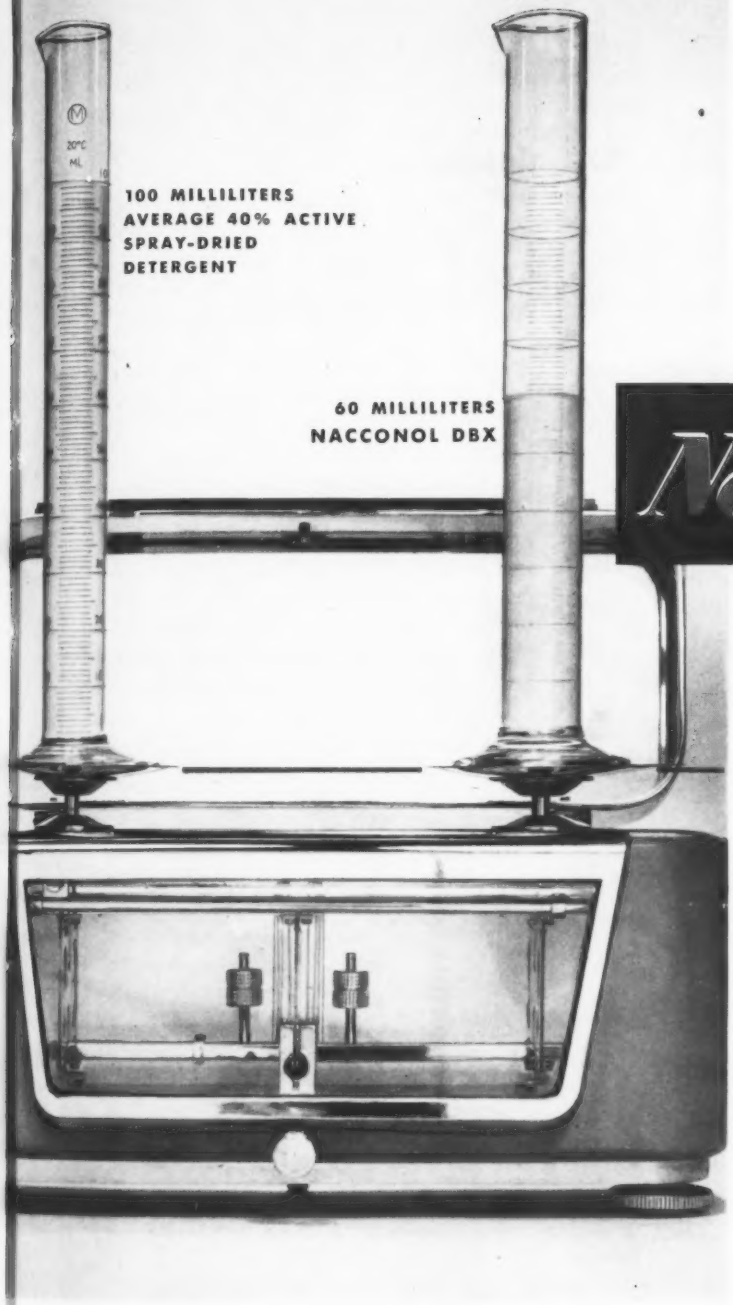

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It's essentially dustless, free-flowing, non-caking!

It eliminates many production problems, makes a more uniform mixture and adds new sales appeal to your detergent product.

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VS57-1

. . . in brief

as the editor sees it . . .

UPGRADING . . . A trend to upgrade perfuming of synthetic detergents and toilet soaps has marked the past two years, according to the comment of a well-known perfumer made to us recently. Improvement in the quality and amount of odor has been noted in the study of a wide range of products. This bears out our own observations and reminds us of our criticism of detergent perfuming a couple of years back. Apparently, it did not take the industry long to learn that Mrs. McGuff, American housewife, did not like an effluvium of kerosene or glue as she added detergent to the hot water of dishpan or washing machine.

As for improvement in toilet soap odors, this has been going on over a long period of years. The blatant aromas of yesteryear are not nearly as much in evidence as they used to be. The quiet, almost unapparent note seems to be the order of the day. But whether Mrs. McGuff likes a residue of perfume to remain after using a toilet soap or prefers the aftermath to be completely odorless is still a moot question.

One thing we sense in this upgrading of soap and detergent perfumes is that the old professionals of the perfume world have taken over. We have a hunch the amateurs made too many mistakes which became evident when products reached store shelves.

* * * * * *

SEWAGE FOAMING . . . Irrespective of the fundamental causes of sewage foam, the soap industry is doing everything within its power to solve the problem. At the recent soap industry meeting in New York, the Soap Association appropriated an additional $100,000 for continued study over the next two years. Based on the report of one of its technical committees, the soap industry is no more convinced today than it was two years ago that detergents flowing into sewers are the sole cause of excessive foaming at sewage plants. And the Association has put its money on the line to find out the facts.

Changes in operating conditions and practices in sewage plants in recent years are still suspect as one of the main causes of excess foaming. Research work done at four leading universities as well as in soap company laboratories, we believe, has turned up some interesting findings in this respect. In the meantime, the Soap Association continues to foot the bill in search of the truth.

* * * * * *

CLEANLINESS PROMOTION . . . The action of the Soap Association at its recent annual meeting in New York to back an industrial soap and detergent promotion plan with an appropriation of $30,000 is a much-needed step. This appropriation will cover chiefly the cost of reprinting the booklet, "The Prevention of Occupational Skin Diseases" by Dr. Louis Schwartz. The first edition of over 25,000 copies has been completely exhausted. Copies went to medical and safety directors in industrial plants and institutions all over the U. S. Publication of a new book, dealing with building and equipment maintenance, will be supported by a portion of the appropriation. The remainder of the fund will be spent on promoting the use of soaps and detergents to industrial consumers through publicity, educational programs, etc.

The value of this program of the industrial division of the Soap Association lies primarily in the fact that it will make more people more conscious of the benefits of cleanliness and sanitation and help to broaden the base of all product sales designed to raise standards of cleanliness.

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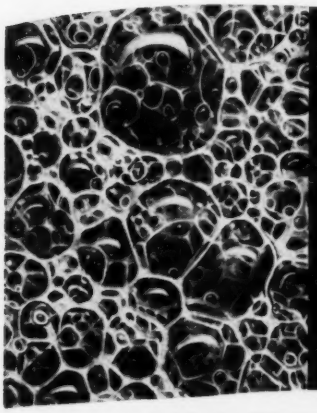

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PILOT HD-90 is odorless, dust-free, dry flowing and whiter in color

PILOT HD-90 is cold processed, high active Alkyl Aryl Sulfonate; 90% minimum active drum dried flake

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Packed in polyethylene lined fibre drums and 5-ply paper bags.

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DANGER AHEAD . . . This year, 47 state and territorial legislatures are or will be in session. Not to mention also, the U. S. Congress. Invariably, this spells trouble for manufacturers of chemical products, detergents, soaps and kindred products. New state laws requiring this or that, restricting this or that will be introduced. Already three new state insecticide laws are in the works. Also three automotive chemical laws, dealing chiefly with brake fluids. This is just the beginning. More will come. Many will be introduced by persons unfamiliar with the subject upon which they hope to legislate. There will be good laws and bad.

Every second year, industry goes through the same old routine. New laws, each adding its share and making it more and more difficult to do business, especially an interstate business, are introduced. Crackpots who get themselves elected to Legislatures do their stuff. They've got to be watched in 47 different places at once by business and industry. A circus juggler has nothing on a trade association secretary at a time like this, as witness current CSMA legislative activities.

For business, each odd year, the so-called "legislative year," adds its complications. And it sure is "danger ahead" for those who do not keep a close watch on their legislatures or in touch with their trade association. A law, once passed, is a law, one which may bring trials and tribulations.

* * * * * *

AEROSOL BUGS . . . Let's face the facts and quit kidding ourselves and each other! Too many bugs have not been removed from too many aerosol products. New and faulty products continue to come to market, products which when they reach the consumer fail to perform in a manner which the consumer has a right to expect. Quick and easy application and use are the stock in trade for every aerosol product. Failing in this, what has the product to offer?

The quick-buck boys alone are not to blame. Some of the offenders are old, long-established firms. And why in the name of good common sense, they will market and continue to market products which are not up to snuff is a puzzle to us. Obviously, it all goes right back to inadequate research, inadequate testing both technically and marketwise. Too much is taken for granted. Marketers hope that their products will operate properly, will stand up on store shelves, will be wholly safe. But it would seem they really don't know.

Every faulty aerosol which reaches a consumer damns all aerosols, injures as well those who market good products. More adequate testing and a closer study of shelf life, we feel, are indicated. Just too many bugs still remain.

* * * * * *

NEW PRODUCTS . . . That new product developments contribute to rising consumption can hardly be quarreled with. Both the introduction of synthetic detergents and aerosol products argue persuasively the basic truth of this statement. Further evidence on the sales advantages of new or improved products is contained in the recent Nielsen report on sales of soaps and synthetic detergents presented during the recent soap industry meeting. An examination of 40 commodity groups for which Nielsen Index records are available indicated that in those groups where major product developments have occurred in recent years, sales increases were significantly better than for the remaining products.

But to fully capitalize on a new product development, it had better be a first in the field. The imitators or followers invariably fail to catch up to the innovator and in most cases lag far behind. If the new development is an improved product, or is more convenient to use, and is slightly cheaper than competitive products it shows an even larger sales gain than an improved but higher priced product.

However, the Nielsen figures show that price is not a major stumbling block to a sale if, of course, the consumer is convinced she is being offered something better. How the consumer is able to determine advantages in product quality still remains unexplained. Nor is the role advertising plays in boosting sales of a new or improved product assayed.

The main conclusion the soap, detergent or specialties manufacturer may draw from these studies is that it pays bigger dividends to create rather than imitate.

TOMORROW'S PRODUCTS TODAY...THROUGH ENJAY PETROCHEMICALS

Basic raw materials for DETERGENTS that get clothes cleaner—faster!

As every housewife knows . . . getting clothes (or dishes or anything) bright and clean isn't half the chore it used to be before she started using today's super-cleaning detergents.

And vital ingredients in the manufacture of these new detergents are Enjay Tridecyl and Ethyl Alcohols and Enjay Tripropylene and Tetrapropylene. Other petrochemicals from Enjay—one of the world's foremost suppliers—play an important role in the manufacture of many other exciting new products for modern living.

The facilities of the famous Enjay Laboratories have just been enlarged to better serve you . . . in finding new ways that Enjay petrochemicals can help you. Call or write for additional information.

Enjay offers a widely diversified line of petrochemicals for industry:

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as the reader sees it . . .

"Pluronics" Trade mark

Editor:

We are writing you with regard to an article entitled, "Classifying Detergents—II" by E. J. Quinn and J. V. Karabinos, which appeared in the November, 1956, issue of *Soap and Chemical Specialties*. In the third column on page 39 of the November issue, the following subject matter appeared.

"In order to determine the percentage of foam depression, each sample must be tested in the above manner with 50 ml. of distilled water using approximately 50 mg. of surface-active agent. Some general knowledge may also be gained from this since most nonionic detergents generally give lower values than do anionic or cationic agents while soaps give the highest foam heights in distilled water. On the other hand, pluronics (sic) and certain thioethers give very low foam heights in water alone."

We wish to call to your attention that the word, "Pluronic," is a registered trademark of Wyandotte Chemicals Corporation. The plural form of the word, and particularly without capitalization or other distinguishing form of printing, constitutes a misuse of our trademark. We respectfully suggest that in the future the word "Pluronic" be capitalized and used together with a general or class term to describe the products sold commercially under the trademark, such as, "the PLURONIC nonionics . . ."

We will sincerely appreciate your cooperation in this matter.

Robert E. Dunn,
Wyandotte Chemicals Corp.
Patent Counsel
Wyandotte, Mich.

Using a "whirlybird" not to catch worms but to save time, Robert G. Fries, Jr., vice-president of Fries & Fries, Inc., Cincinnati perfuming materials firm, employs helicopter service to fly from Greater Cincinnati Airport direct to his factory 20 miles away. Here Mr. Fries arrives from trip to east. Service also picks him up at plant to make nearby flight connections.

Seeks U. S. Lines

Editor:

We have been a subscriber for quite a number of years to your magazine, which we have always found very interesting.

Therefore, we were wondering if you could assist us in the following matter.

We are a company which is at present manufacturing in this country, disinfectants, cleaning soaps, polishing waxes, deodorizers, and general cleaning material for the janitor trade and we distribute as well cleaning adjuncts such as mops, brooms, buckets, etc. and we have been carrying this out for the past 25 years.

We have now decided, in order to increase our sales potential and our range of lines, to approach an American company to ask this company if they would consider having us market their products in Australia.

We have decided to do this because we consider that apparently your country has quite a number of manufacturers which specialize in the field in which we are operating and would be able to offer us more specialized products in the waxes and cleaning fields, and by doing so allow us to offer to our clients in this country these highly specialized products.

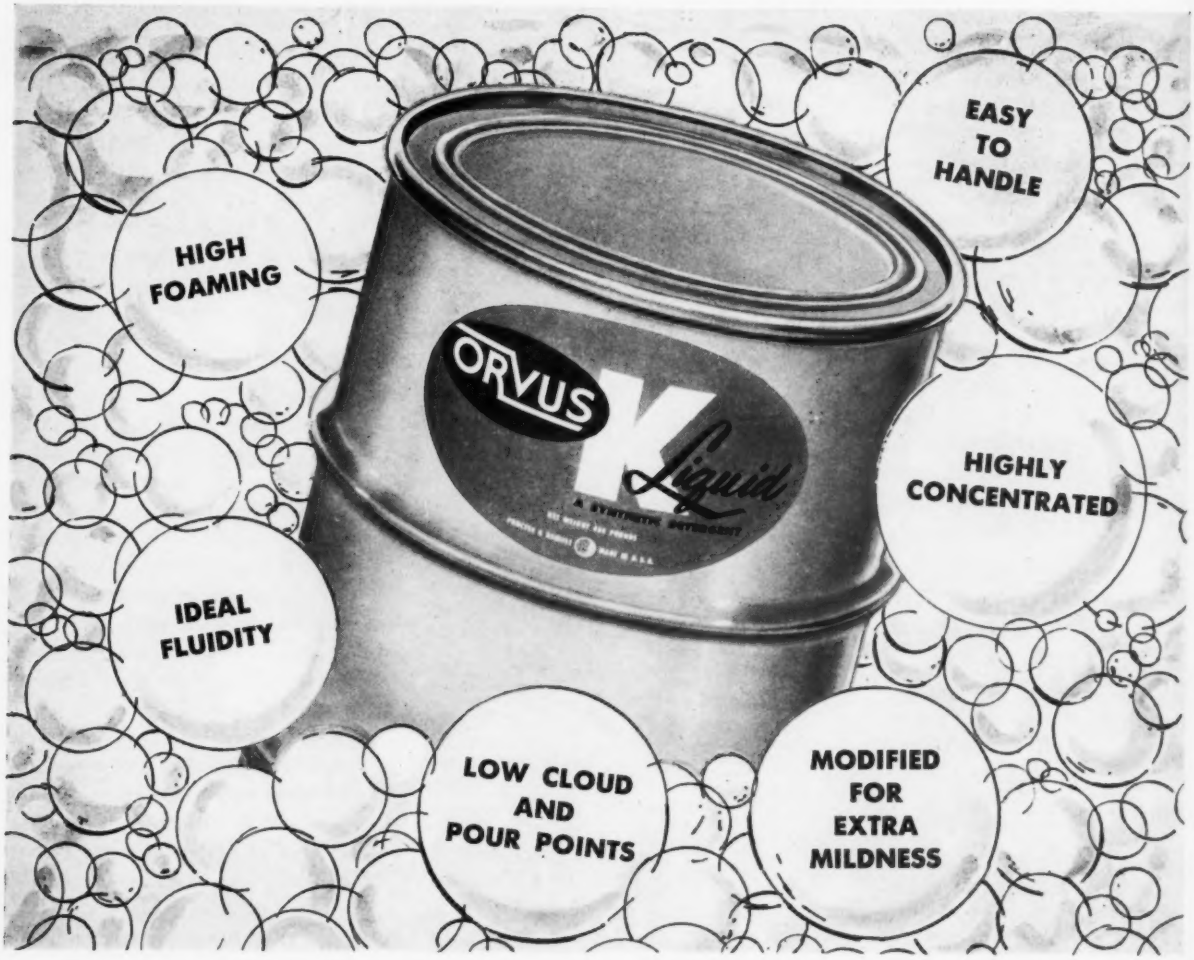
We are particularly interested also in obtaining from recognized American companies products for use in the industrial field —particularly detergents. We refer to such firms as Magnus Chemical Co., Turco Products Co., etc. who are operating under arrangements in this country.

Since it is impossible to import from the United States the type of goods which we desire, we would like to discuss with American companies we contact, the manufacturing under license in our own factory in Australia, which as you are aware is done in many cases.

We are able to give an American company full and complete coverage throughout the

(*Turn to Page* 209)

6 Good Reasons
for formulating liquid detergents with ORVUS K LIQUID



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Your best bet for formulating liquid detergents where high foaming is required, Orvus K Liquid can help you boost profits—and customer satisfaction—every time! For full information on the many advantages this cosmetic-grade, ammonium lauryl sulphate type can offer *you*, drop a postcard to . . .

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Dr. Herbert L. Dutton, U.S.D.A. research chemist, left, accepts honor plaque as top winner of 1958 Glycerine Research Award for his work on composition of natural fats and oils. A. K. Tosh of Colgate-Palmolive Co., chairman of glycerine research committee, presents plaque and $1,000 award during recent 30th annual soap meeting in New York.

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Glycerine
Hand cleaners
Laundry soaps
Liquid soaps
Metal cleaners
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LEADERS IN AROMATIC CHEMICAL RESEARCH

Synthetic Detergents

—*The British View*

By Frank Schon*

Marchon Products, Ltd.
Whitehaven, Cumberland, England

THE origin of the modern synthetic detergent business can be traced back to the first world war, when German patent 336,558 disclosed the process for alkylation of naphthalene with isopropanol and concurrent or subsequent sulfonation. Products obtained by this method and similar ones still find fairly extensive application in the textile industry.

In the late twenties, the I.G. Farben Industrie began to market "Igepon T," an amide-linked alkane sulfonate made from oleic acid chloride and methyl taurine. This was shortly followed by the commercial exploitation of fatty alcohol sulfates made from cetyl oleyl alcohols derived from sperm oil by saponification and steam distillation, and from coconut and palm kernel oil alcohols produced by the high-pressure hydrogenation of triglycerides, fatty acids or esters in the presence of copper and chromium catalysts. Before the development of the catalytic hydrogenation process the now well-known Bouveault and Blanc process for fatty alcohol production had been developed in the early 1900's by the reduction of fatty esters with metallic sodium and an alcohol. Both processes, sodium reduction and high-pressure hydrogenation, are practiced on a very large scale in a number of countries, and especially in the United States. In the hydrogenation process various catalysts are used; the pressure is about 300 atmospheres, and temperature between 200° and 300° C.

During the war years 1939-1945, further progress was made in the development of detergents. In Germany large quantities of alkane sulfonates were made, using the process developed by Cortes F. Reed. Meanwhile, in Holland and in Britain, oil companies were busy developing their secondary alkyl sulfates from the cracking and sulfation of higher petroleum waxes. In Britain ethylene oxide-derived products were first manufactured on a large scale. In the U.S.A., just before and during the war, sulfated monoglycerides of coconut oil fatty acids found specialized application.

The real expansion in surface-active agents took place in the post-war years, primarily in the United States, where war-time restrictions were lifted much more quickly than in Europe, and no effort was spared to introduce and sell to the housewife attractive washing powders based on synthetic surface-active agents.

The most important individual item of all washing materials sold in any form, liquid, paste, solid or powder, is the packed powdered product. Some 300,000 tons of these products are now sold annually in the United Kingdom, and although more than half are based on synthetic detergents, the largest individual seller is still a soap product.

The main uses for non household type surface-active agents lie in the textile, laundry, cosmetic, metal treatment and agricultural industries.

With textiles, surface-active agents have found application in practically all branches including wool, cotton as well as synthetic fibre processing, covering the dyeing, printing, stripping and finishing sections of the industry.

In commercial laundries a fair proportion of the organic washing media used is based on synthetic detergents. With the introduction of new machines the laundry industry now accepts built detergents more readily. They can be added directly to the machine. These built detergents are characterized by a controlled foaming action and eliminate the need from the launderer's point of view to store stock solutions both of soap and alkalis in the wash house.

Cosmetic applications include predominantly their use as lathering agents in shampoos; minor quantities of specialized types are used in dentifrice and bath preparations. Some also find applications as emulsifying agents.

In the field of metal treatment surface-active agents are used in cleaning operations, metal pickling and electroplating and as emulsifiers in the manufacture of cutting oils.

The use of more specialized products is now common in agriculture, since wetting-out agents and emulsifiers are used in the man-

* Condensed from a paper given at the annual general meeting of the Society of British Soap Makers, Nov. 21, 1956. The paper appears in full in the January issue of *Soap, Perfumery & Cosmetics.*

ufacture of dispersible insecticides and herbicides in the form of dispersible powders or emulsions.

The use of non-ionic and anionic agents has been proposed in the cement and concrete industry, where some products are used in the preparation of mortar additives (as a partial replacement for lime in cement mortars), in aerating concrete to obtain lightness and improved insulating properties, and in the preparation of mass concrete where non-ionic agents are added to the concrete mix to facilitate the pumping of the liquid concrete.

Powder form detergents have been by far the largest sellers in the household field.

In recent years there has been a substantial increase of activity in the liquid detergent field in the United States.

A rough classification of household detergent products can be made as follows:

(1) Light-duty powder detergents
(2) Heavy-duty or all-purpose powder detergents
(3) Liquid detergents
(4) Mixed soap-synthetic bars
(5) Scouring powders

It is said that the American housewife, possibly conditioned by the American method of advertising, is willing to have a number of specialized washing products for various purposes. Generalizations are usually inaccurate, but if the following points are considered it may well seem that in the years to come the specialization which is already apparent in the United States will take place here as well.

(1) Light-Duty Powders

THERE has been a demand for light-duty powder detergents primarily for use in dish-washing and in laundering woolens and other fine fabrics. Formerly the monoglyceride sulfates were used diluted with sodium sulfate, now nearly all such detergents are based on spray-dried bead form sodium alkyl aryl sulfonates built with sodium sulfate and containing about 25-30 percent of active ingredient. A trace of phosphate to adjust the *p*H of the product is normally added.

(2) Heavy-Duty Powders

AS is well known, these represent by far the largest part of the synthetic detergent business, and their formulation is a complex chemical problem. The main components of heavy-duty powder detergents can be listed as:

(a) Detergents and foaming agent
(b) Foam stabilizer
(c) Phosphates
(d) Silicate
(e) Carboxy methyl cellulose
(f) Sodium perborate
(g) Fluorescent dye
(h) Perfume
(i) Anti-staining agents, etc.

(*a*) *Detergent and Foaming Agent:* There have been for a long time two schools of thought about the most suitable detergent and foaming agent for a heavy-duty detergent; one recommends a straight alkyl aryl sulfonate and the other a mixture of a tallow fatty alcohol sulfate and alkyl aryl sulfonate. In the United Kingdom it is now generally accepted that a straight alkyl aryl sulfonate allows the most economic approach and gives the best consumer acceptance. Tallow alcohol sulfates have been held to have a better detergent action than alkyl aryl sulfonates, but they are difficult to process and the product tends to lack solubility in cold or lukewarm water. The use of fatty alcohols in household detergents may also introduce an odor problem which is not experienced with alkyl aryl sulfonates.

The principal alkyl aryl sulfonate now used is tetrapolypropylene benzene. The price of alkyl benzene from 1947 has shown a constant decrease from about 30¢ per lb. in 1947 to slightly over 12¢ per lb. in 1954, while the price of tallow—the raw material of tallow alcohol—has fluctuated considerably during the same period, and has not shown anything like the same advantageous and constant decrease.

The facts just mentioned may explain why fatty alcohols are not so pre-eminent in the development of detergents in the United Kingdom as they are in the United States although from the point of view of currency it should be the other way round.

(*b*) *Foam Stabilizer:* The housewife has been conditioned to judge the efficiency of a washing powder to some extent by its foaming properties and particularly by good foam under a heavy dirt load. To satisfy these conditions a series of fatty acid alkylolamides has been made and used, and a concept of balanced lathering properties has gradually evolved. If the housewife sees the lather disappear too early when she is washing dishes or clothes, she will add more detergent even though plenty may remain in the washing solution. If, on the other hand, the lather is too persistent and voluminous then she may use less detergent than is required and may not consider the product satisfactory because it does not then wash as well as she expected.

The selection of alkylolamides is governed largely by cost. While various cuts of fatty acids, from whole coconut to substantially pure C_{12} fatty acids, have been condensed with monoethanolamine, monoisopropanolamine and diethanolamine, the most economic foam booster for alkyl aryl based powder detergents is now generally considered to be coconut monoethanolamide. Diethanolamides were formerly produced at about 60 percent concentration by the classical "Ninol" process, but of late substantially pure diethanolamides have been made and are commercially available. They have not yet, however, found any general acceptance in heavy-duty washing powders. A further series of products which has been used as efficient foam stabilizers consists of ethylene oxide adducts of coconut and lauric monoethanolamide. These have good solubility char-

Recent developments in formulation and marketing in U. S. and Great Britain

acteristics, an advantage particularly in liquid formulations.

(*c*) *Phosphates:* During the early phases of the introduction of detergent powders only trisodium phosphate and tetrasodium pyrophosphate were available. Formulations using these materials were not really satisfactory. In multiple washings there was a gradual deterioration in color of the washed fabric. With the introduction of the molecularly condensed sodium tripolyphosphate a considerable improvement in resistance to greying was noticed. Besides having good water-softening properties, sodium tripolyphosphate has enhanced dirt removal and soil suspending powers, and assists in the production of a good bead from the drier. It is now generally accepted that between 33 and 50 percent of molecularly condensed phosphate, either as sodium tripolyphosphate or as a mixture of sodium tripolyphosphate and tetrasodium pyrophosphate, is necessary in a good heavy-duty household detergent.

(*d*) *Silicate:* Silicates have for long been used in soap-based formulations as builders and to increase the alkalinity of the product and prevent attack on aluminum ware. Similarly, the addition of five to six percent of silicate solids is now considered conventional in heavy-duty washing powders. This addition of silicate, besides having an anti-corrosive effect, also assists in the manufacture of a firm beaded product.

(*e*) *Carboxy Methyl Cellulose:* Reinforcement against gradual color deterioration on multiple washings, and an improvement in dirt suspending powers, is achieved by the addition of about one percent of sodium carboxy methyl cellulose. This is now considered to be standard practice.

(*f*) *Sodium Perborate:* One of the major problems which faced the synthetic detergent formulator was that conventional soap-based washing powders contained sodium perborate and were effective in removing stains, especially when used at the boil. Sodium perborate was therefore incorporated in the heavy-duty synthetic powders to give them the same stain-removing properties, and the majority of U.K. detergent powders now contain about four to seven percent of sodium perborate.

Much work has been done on the stabilization of sodium perborate to make it capable of removing stains and bleaching as effectively as possible. Basic magnesium salts or magnesium silicate were used for some time, but recently have been replaced by the organic metal sequestering agent, ethylenediamine tetra acetic acid.

(*g*) *Fluorescent Dye:* With both soap and synthetic based products a considerable increase in the apparent whiteness of the product was achieved by incorporation of a substantive fluorescent dye. This has become standard practice.

(*h*) *Perfume:* Although a good heavy-duty detergent could be formulated as described, the question of presentation should now be considered. It would be perfectly possible to mix the ingredients together in the form of powders and pastes, and to let the material set into lumps, break it up and pack it for domestic use. However, while formulations have been developed, techniques of manufacture, especially the technique of spray-drying, have evolved at the same time. Washing powders are now prepared by slurrying the ingredients of the composition and passing them through a drier co-or counter-currently to a hot air stream where the moisture content is reduced to approximately 10 percent in the finished product. The product can then be passed to the conditioning stage, where it is cooled, perfumed, etc. Heat-unstable substances, such as sodium perborate, can then be added. The final bulk density is of the order of 0.35 and the finished product has a pleasant appearance, and possesses a much increased solubility in both cold and hot water, over the physically mixed products. A further development has been the introduction of blue powders, which contain pigment and now represent a substantial part of heavy-duty synthetic detergent sales.

(*i*) *Anti-staining Agents:* Combinations of active foaming agent and condensed phosphate were found to stain certain types of cutlery. Small additions of ethylene thiourea or similar products prevented the staining. However, the incorporation of sodium perborate in these formulations obviated all further need for additional anti-staining agents.

During the past few years physically mixed powders designed specifically for washing machines have aroused considerable interest, especially in the United States. So far there has been no parallel development in the United Kingdom. The use of high foaming detergents is not very satisfactory in the usual household washing machine which is either of the spinning disc or the agitator type. The correct amount of detergent may produce surplus foam to spill out of the machine. If the detergent dosage is measured by the amount of foam too little will be used for satisfactory cleansing action. A balanced low foaming detergent is necessary, and the product is generally supplied in a heavy form, either as physically mixed or as a heavy spray-dried powder, with a bulk density of about 0.5.

The various fillers and builders are similar to those used in the conventional heavy-duty powder detergents, but the active ingredient is chosen to give low foaming. This can be achieved either by the use of a non-ionic detergent or by the use of alkyl aryl sulphonate/soap mixtures.

(*Turn to Next Page*)

(3) Liquid Detergents

BEFORE the introduction of the spray-dried powder detergents in Britain a large number of liquid detergents, mostly based on secondary alkyl sulfates, but also on non-ionic detergents, were on the market, many in the form of very dilute solutions. Most of these have not survived, but one or two of the more highly concentrated preparations have held their position in the market although they have been unable to make much headway.

In the United States a similar development occurred. But by now a number of well-advertised, highly concentrated, liquid detergents, packed in bottles or cans, have found considerable acceptance. Light-duty liquid detergents are based either on alkyl sulfates or alkyl aryl sulfonates. One type is based on ammonium lauryl sulfate and a foam stabilizer such as coconut monoethanolamide, with a water content of not more than 40 percent. Another type is based on ammonium dodecyl benzene sulfonate, together with a substantial quantity of fatty acid diethanolamide and a co-active agent containing ethylene oxide. Light-duty liquid detergents are now said to be sold in the United States at the rate of over 110,000 tons per annum.

Very recently a heavy-duty liquid has appeared on the U. S. market, containing active matter, condensed phosphates and fluorescent dyes. This product is formulated to compete satisfactorily with the heavy duty detergent powder.

(4) Soap-Synthetic Bar

IN the United States there has been much development and test marketing of soap-synthetic bars. The original synthetic detergent-based bars were generally highly priced, contained too much active ingredient and tended to defat the skin. They were difficult to process, especially on high-speed soap processing machinery. Mixtures of soap and synthetic detergents have been tested more recently. Here the soap acts as a filler and binder and auxiliary detergent, and the synthetic confers a degree of lime soap dispersion on the soap so that the drawbacks of soap in hard water can be eliminated.

Various mixtures have been, and are still being, tried, but the essential features of any synthetic which is to be added to soap are good lime soap dispersing powers, relative non-hygroscopity in the dry state and absence of stickiness, cracking, etc., in the product. Further developments in this direction are likely to take place in the U.K. before long.

(5) Scouring Powders

FOR many years now the housewife has been accustomed to the use of scouring powders based on finely ground sand and soap together with a small percentage of soda ash. These have now been almost entirely replaced by powders based on finely ground sand and alkyl aryl sulfonate/phosphate compositions; the resulting powders have better foaming properties and more attractive appearance, and do not form lime soap.

Powder Bleaches

THESE products, though not strictly in the detergent class, play an important part in household washing and sanitizing operations. Washing methods and washing habits differ from country to country, and these methods are again influenced by a constantly changing pattern brought about by mechanized aids to washing, new textiles, etc. In the United States most households have a washing machine; in other countries most of the washing is still done by more traditional methods. In the United Kingdom the boil/wash/bleach procedure is still prevalent: in the United States washing is carried out at a much lower temperature.

In the United Kingdom, perborates, which give a controlled and safe bleach, are in most common use, but a new current of bleaching technique has recently become discernible in the United States. There, two products are now being marketed: the so-called light-duty powder bleach intended for use on fine fabrics, and the heavy-duty bleach which is intended to replace the conventional hypochlorite in domestic sanitizing, and for washing heavily soiled clothing.

The light-duty powder bleaches consist largely of sodium perborate with fillers such as phosphates and sulfates, and are very often found to be physical mixtures, although some are sold in spray dried form.

The heavy-duty bleaches are based on organic compounds containing chlorine, such as dichloro dimethyl hydantoin, and are further built with phosphate, sulfate, a small amount of detergents, and fluorescent dye. The active chlorine content is usually about 5¼ percent in agreement with the conventional hypochlorite liquids.

These new bleaching agents are either wholly or partly spray dried. The main advantages claimed for the heavy-duty powder bleach are safety and ease of handling and transport.

★

Heyden Newport Officers

Heyden Newport Chemical Corp., which has resulted from the merger of Heyden Chemical Corp. and Newport Industries, Inc., both of New York, recently announced that Simon Askin has become president and chief executive officer. Mr. Askin, who joined Heyden in 1943, has been president since 1952 and a director since 1948.

Armin A. Schlesinger, who had been chairman of Newport, will hold the same office in the surviving company. John P. Remensnyder, chairman of Heyden since 1952, has been elected vice-chairman.

The business of Newport will be continued as Newport Industries Company, a division of Heyden Newport. E. F. Sisson becomes president and S. J. Spitz, vice-president of the division, posts they held with Newport. They were also elected vice-presidents of the parent corporation.

Measuring relative abrasive characteristics of

Household Cleansers

A new procedure for measuring the abrasiveness of household scouring cleansers achieves a high degree of accuracy. Deviations for paired runs and variations among successive runs negligible.

By C. A. Gerardi*
United States Testing Co.
Hoboken, N. J.

TO complete an efficient evaluation of any type of product one must employ certain basic steps after the pattern of the following:

1. Define the principal objective of the product in question.
2. Define the properties of the ideal or perfect product for accomplishing these objectives.
3. Select and apply appropriate measures of each property and determine the extent of variances from the ideal.

Although the present paper is concerned only with the selection of improved measures of one of the potentially negative properties of household cleansers let's consider the other steps in order to give perspective on this one property.

1. The principal objective of the typical household cleanser is: To aid in the cleansing of porcelain, sinks, bath tubs, pots, pans, tiles, appliances and other surfaces which are exposed to relatively tightly adhering accumulations, forming stains, spots, dirt, food or other materials.

2. The ideal cleanser will promote complete removal of any accumulation from the surface safely, efficiently and economically. More specifically, the ideal cleanser will in use be safe, in that it will not injure the hands of the user, nor the surface being cleaned; be efficient in that it will require a minimum of time, effort and quantity of cleanser; and economic in that it will cost the minimum.

3. Appropriate measures include, in general, standardized measures of insult to skin and/or surface cleaned, quantity of accumulation before and after standardized cleaning action in which time, energy and quantity are controlled; and finally, the cost. You will note that in the illustration of the evaluation process just cited that special features or additives which may influence consumer satisfactions could be included in the matrix if desired. The presence of sudsing agents, odorants or bleaches can readily be related to the objectives and assigned values in relation to the idea. All properties, however, except the one quality of safety are outside the scope of this paper. Nevertheless it is my objective to treat abrasiveness which can be both positive and negative. In incorporating an abrasive component, household cleaners have improved efficiency in cleaning but they may have the potential negative property of removing some of the surface being cleaned. There can be little doubt that the value of a given cleanser is lowered in direct proportion to the extent that it injures the surface.

Unfortunately, an accepted standarized test of the tendency for a cleanser to insult typical surfaces has not yet been devised. Let's consider some of the methods which have been published, and review the limitations of each.

1. A method is given in the Federal Specifications (1) (dated Jan. and March 1942) for qualification testing of a material for its abrasive properties. Essentially, this method relies on visual measurement of abrasion. The test surface is on two microscopic slides between which a slurry of the test cleanser has been placed. The flat surfaces of the slides are rubbed together by hand for a set time, rinsed and visual inspection is then made.

2. A second method is described in the January 1956 issue of *Consumer's Report* (2). Generally speaking this method resembles the preceding one (glass slides and slurry). However, two changes are introduced. First, the application of the abrasive slurry is controlled by use of a "boot" coated with a definite amount of sample and attached to a specially constructed device with a reciprocating abrading arm. Secondly, photographs of the slides provide records which can at least be rechecked by additional observers.

3. The third procedure is an adaptation of the Method for Measuring Abrasive Characteristics of Toothpaste (3). This method is based on the loss in weight of small silver test stirrups. These are passed continuously through a slurry of the abrading material which has been introduced on a paraffin wax base which has been placed on a turntable. Since this method was developed for evaluation of only the mildest abrasive agents (i.e. those used in toothpaste and powders) it is not deemed readily ap-

* Paper presented before the Chemical Specialties Manufacturers Assn. 43rd annual meeting, Washington, D. C., Dec. 4, 1956.

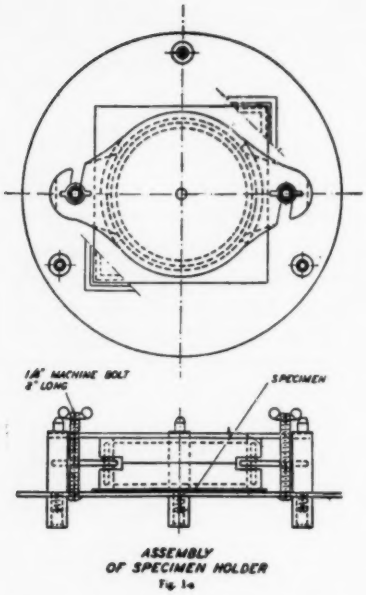


Figure I. Assembly of specimen holder.

plicable to testing of household cleansers, which are considerably more coarse. None of these procedures just described is completely adequate from the point of view of laboratory technology.

A little later I shall describe a new procedure for measuring the abrasiveness of cleansers. We have found that it yields satisfactory results at least from our limited preliminary data. We have reason to believe that additional work with this method will confirm our original success.

Before describing this method however, I would like to give a brief summary of its origin.

Some years ago, the Porcelain Enamel Institute recognized the problem of measuring abrasiveness and assigned a task force to find improved techniques. The investigation was directed toward the measurement of the ability of porcelain or porcelained surfaces to withstand general abrasion. In 1942, this group assembled and published a Tentative Standard Test for Resistance of Porcelain Enamels to Abrasion (4). The procedure was helpful and was used consistently by the entire industry. Thirteen years later, in 1955, The Porcelain Enamel Institute Quality Development Committee revised and improved the original test method by introducing a newly designed abrasion test machine for better control of the abrading process.

Table I. Feldspar—Six and a half minute abrasion time

	Run I		Run II		Run III		Run IV	
	Initial Gloss	Final Gloss	Initial Gloss	Final Gloss	Initial Gloss	Final Gloss	Initial Gloss	Final Gloss
	63.5	32.0	60.5	29.5	61.0	30.5	61.5	31.0
	63.5	31.5	60.5	30.5	61.0	30.5	61.5	31.0
	63.5	32.0	60.5	31.5	61.0	30.5	61.5	31.0
Average	63.5	31.8	60.5	30.5	61.0	30.5	61.5	31.0
Abrasion Index	50.1		50.4		50.0		50.4	

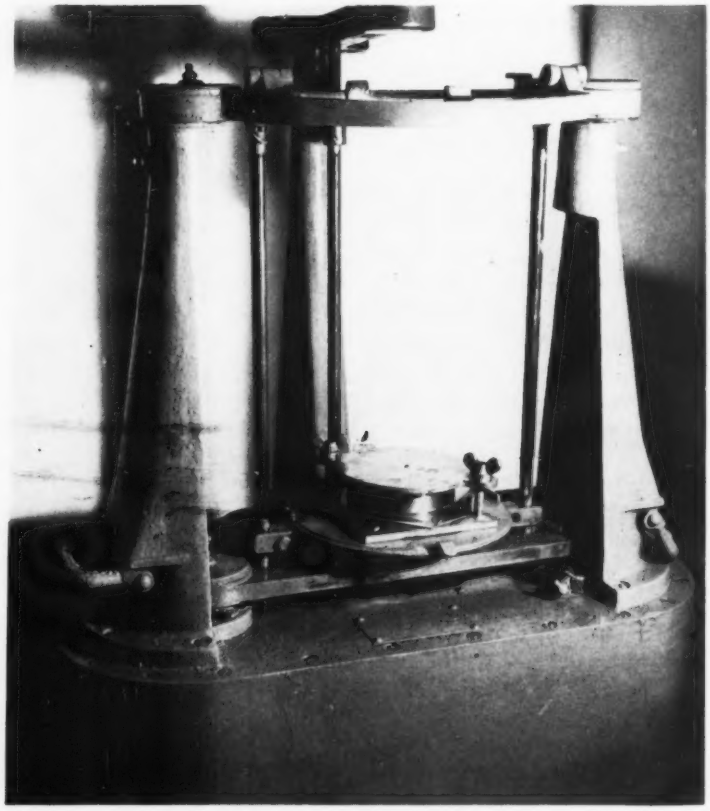
The method just described prompted the idea for the present procedure. However, our purpose is concerned with the abrasiveness of the cleansers rather than the abrasion resistance of the substrate to which the P.E.I. study was directed. Again, results of this method give promise of being accurate, reproducible measurements of the relative abrasion characteristics of household cleansers.

Although a basic similarity in abrasion techniques will be found between this method and the P.E.I. method, we have instituted many changes in the specific techniques and materials involved.

We chose as the substrate for measuring abrasive properties polished calibrated plate glass panels. The panels offered a surface hard enough (#6 on the Mohs Scale of Hardness) to be somewhat typical of the type of surface often encountered in the actual usage of cleansers. They were also available in a polished, calibrated form, forming a standardized surface from which original or "before" gloss readings could be taken.

For the abrasive action we

Figure II. Tyler Ro-Tap Machine



employed the Tyler Ro-Tap machine as will be noted. It was believed that the circular, continuous and reproducible action obtained in its operation best simulated actual circular motion which could be duplicated with each sample. The instrument's availablility is, of course, another deciding factor.

Description of Method

MATERIALS and Apparatus Employed: 1. Standard calibrated 4 inches by 4 inches polished plate glass panels to an initial gloss reading of approximately 60 units (5).

2. Alloy balls. Rust resistant of the type used for bearings 5/32 inches in diameter (6).

3. Standard feldspar of 320 mesh (7).

4. Stop watch—calibrated to within 0.2 seconds for a 10 minute period.

5. Photovolt Reflectometer equipped with a 45° gloss attachment.

6. Specimen holder. See Figure I.

7. Tyler Ro-Tap machine. See Figure II.

8. Five milliliter pipette.

9. Alcohol, ethyl or special formula 3A.

The standard glass panels were prepared for this test in the following manner: Each panel was washed with a soft sponge, previously moistened with a warm one percent solution of trisodium phosphate. The panel was then rinsed in warm tap water and, while still wet, rinsed with alcohol. The panels were allowed to air-dry in a vertical position for 20-30 minutes. At all times care was exercised in handling the glass panels to prevent finger marks from impairing the polished surface.

After the drying period, the initial gloss measurement was taken. Three gloss readings per panel were made turning the specimens in a 90° clockwise position between readings.

In this test 320 mesh feldspar was employed as a reference standard. Therefore, by trial-and-

Table II. Sample Cleanser "A" (special purpose cleanser)

	Run I		Run II		Run III		Run IV	
	Initial Gloss	Final Gloss	Initial Gloss	Final Gloss	Initial Gloss	Final Gloss	Initial Gloss	Final Gloss
	61.5	49.5	61.5	48.5	60.5	47.0	61.5	47.5
	61.5	49.5	62.0	48.5	60.5	46.5	61.5	46.5
	61.5	49.0	62.0	48.5	60.5	47.0	61.5	47.5
Average	61.5	49.3	61.8	48.5	60.5	47.2	61.5	47.1
Abrasion Index	80.2		78.5		78.0		76.4	

Table III. Sample Cleanser "B"

	Run I		Run II		Run III		Run IV	
	Initial Gloss	Final Gloss	Initial Gloss	Final Gloss	Initial Gloss	Final Gloss	Initial Gloss	Final Gloss
	61.0	37.5	63.0	36.5	60.5	36.5	60.5	38.5
	60.5	37.5	62.5	36.0	60.5	36.5	60.5	38.0
	61.5	38.5	62.5	36.5	60.5	37.5	60.5	38.5
Average	61.0	37.8	62.6	36.3	60.5	36.8	60.5	38.3
Abrasion Index	61.9		57.9		60.8		63.3	

Table IV. Sample Cleanser "C"

	Run I		Run II		Run III		Run IV	
	Initial Gloss	Final Gloss	Initial Gloss	Final Gloss	Initial Gloss	Final Gloss	Initial Gloss	Final Gloss
	60.5	26.5	62.5	26.5	61.5	25.5	62.0	26.5
	61.0	25.5	62.5	26.5	61.5	26.5	61.5	26.5
	60.5	26.5	62.5	26.5	61.5	26.5	62.0	26.5
Average	60.6	26.1	62.5	26.5	61.5	26.1	61.8	26.5
Abrasion Index	43.1		42.4		42.4		42.9	

Table V. Sample Cleanser "D"

	Run I		Run II		Run III		Run IV	
	Initial Gloss	Final Gloss	Initial Gloss	Final Gloss	Initial Gloss	Final Gloss	Initial Gloss	Final Gloss
	61.5	*25.0	63.5	27.5	62.5	25.5	62.0	24.5
	62.0	24.5	63.5	27.5	62.0	25.5	61.5	24.5
	62.0	25.0	63.5	27.5	62.5	25.0	62.0	25.0
Average	61.8	24.8	63.5	27.5	62.3	25.3	61.8	24.6
Abrasion Index	40.1		43.3		40.6		39.8	

Table VI. Sample Cleanser "E"

	Run I		Run II		Run III		Run IV	
	Initial Gloss	Final Gloss	Initial Gloss	Final Gloss	Initial Gloss	Final Gloss	Initial Gloss	Final Gloss
	60.5	24.5	62.5	26.5	61.5	26.5	61.5	26.5
	59.5	23.5	62.5	26.5	61.5	26.5	61.5	26.5
	60.5	24.0	62.0	26.5	61.5	26.5	61.5	26.5
Average	60.1	24.0	62.3	26.5	61.5	26.5	61.5	26.5
Abrasion Index	39.9		40.6		43.0		43.1	

Table VII. Sample Toothpowder

	Run I		Run II		Run III		Run IV	
	Initial Gloss	Final Gloss	Initial Gloss	Final Gloss	Initial Gloss	Final Gloss	Initial Gloss	Final Gloss
	62.5	61.5	63.5	61.5	61.5	60.5	62.0	60.5
	62.5	61.5	63.0	60.5	61.5	60.0	62.5	61.0
	62.5	62.5	63.0	60.5	61.5	60.5	62.5	60.5
Average	62.5	61.8	63.1	60.8	61.5	60.3	62.3	60.6
Abrasion Index	97.3		96.4		98.0		97.3	

error method, we first determined the testing time necessary to reduce 45° specular gloss of the glass specimens by 50 percent (± 0.5%) using feldspar. This criterion was arbitrarily selected as a useful endpoint. Time is a more convenient measure since the rate is constant.

To determine this abrasion time, two grams of feldspar (accurately weighted to ± 0.01 grams) were placed in the center of a glass and the panel was centered in the holder, face or gloss side up. One hundred and fifty grams of the 5/32 inch rust resisting alloy balls (weighed accurately to ± 0.15 grams), were rolled gently into the feldspar. The cover of the specimen holder was then fastened to the holder and five cc of distilled water were pipetted through the top. This assembly was then placed on the Tyler Ro Tap machine and abraded for two equal time periods turning the specimen holder through 90° between each time period.

The test requirement of a 50 percent reduction in 45° specular gloss using feldspar was met with a time of 6½ minutes. Tests on the sample cleansers were conducted in the same manner, using the 6½ minute time period.

After abrasion, the glass panels were removed from the holder and immediately cleaned by holding under briskly running tap water for about 45 seconds. Excess water was shaken off and the panels were rinsed in a stream of alcohol and left to dry in a vertical position. Final gloss measurements were taken within 30 to 90 minutes after cleaning in the same manner as for the initial gloss readings.

The loss in gloss of the glass panel was recorded and the abrasion index calculated by use of the mathematical relation:

$$\text{Abrasion Index} = \frac{\text{Final Gloss Reading} \times 100}{\text{Initial Gloss Reading}}$$

As is evident from the formula, the abrasion index is a measure of the amount of gloss retained by the glass panel after abrasion. Therefore, the higher this value the less abrasive is the powder under test.

In order to avoid a surface variable, these readings were taken in the same area of the glass panels each time. This was accomplished by scoring the side or edge of the panel as a reference point on taking the initial gloss readings.

In this study we employed five household cleansers purchased on the open market, one of these cleansers being of a specific type intended primarily for a particular household kitchen chore. In addition to these cleansers a commercially available toothpowder was included for comparative purposes. Each sample was run in quadruplicate. Results are given in tables I to VII on Pages 48 to 49.

Summary

THE above results are based on data from our initial studies. Although it is not deemed of a nature to permit final statistical conclusions to be made, the following observations are considered to be significant.

1. A high degree of accuracy is achieved with this method. As shown in the preceding calculations of the abrasion indices, the deviations for paired runs are negligible.

2. The variations among successive runs on a sample are also insignificant.

These slight variations show that the results obtained by this method are reproducible and reliable.

3. Good sensitivity of the method is indicated. This is shown by the wide span between abrasion indices obtained for a fine material (as the toothpowder) and the coarser material, the cleansers. Differences in coarseness between cleansers is also detected by the method employed.

Further studies of this data and other data obtained in the future employing this method will be treated statistically and made available.

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1. Federal Specifications, P-P-546, P-P-596a.
2. *Consumer's Report*, January 1956.
3. *Ind. & Eng. Chem.* Analytical Ed. Vol. 12, 1940. Page 419. (Ste. Genevieve Lime Co.) R. W. Smith.
4. P.E.I. Bulletin T-2 (1955).
5. Available from P.E.I. 1145 Nineteenth Street, N.W., Washington, D. C.
6. Available from Atlas Ball Co., Phila., Pa.
7. Fisher Scientific Supply.

More Scent for Liquid Soap

Liquid soaps could gain in popularity if they were adequately perfumed, according to a feature article published in the November issue of *The Givaudanian*, house organ of Givaudan-Delawanna, Inc., New York. Liquid soaps are a mixture of coconut oil and potassium hydroxide, but some are made with palm, soybean, and other oils and less expensive fatty acids. Germicidal ingredients, such as hexachlorophene, may be present. Liquid soaps are usually sold in 30 to 40 percent concentration which is reduced on actual use to 15 to 20 percent.

Depending on the end use, the task of the perfume composition may be only to mask the basic odor of the liquid soap ingredients, or to add distinctive scent to the finished product.

The factors to be considered by the perfumer may be summarized as follows: 1. Physical and chemical properties of the liquid soap. 2. Bactericidal and other additives and their effect on perfume oils. This includes certain synthetic detergents which may be added to the liquid soaps in certain sections of the country because of local water conditions. 3. Solubility of perfume oil in the soap before and after dilution. 4. Compatibility and stability of perfume oil in the presence of free alkali. 5. Tendency of perfume oil to cause cloudiness in soap due to insolubility.

In addition to these considerations the perfume must not lose its fragrance or undergo noticeable change during the ageing of the soap. Furthermore, it must

(*Turn to Page* 211)

Development problems of chemical concerns

Supplying Detergent Alkylate

By James C. Kirk and E. R. Baker*
Continental Oil Co.
Ponca City, Oklahoma

IN discussing the development problems associated with the detergent industry, and primarily those associated with so-called detergent alkylate, this article will be slanted from the suppliers' viewpoint. We shall confine ourselves to the alkyl benzene types of intermediate and in particular to those derived from propylene polymers.

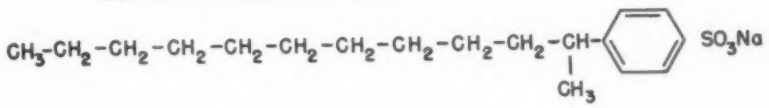
In brief review, the first commercial detergent alkylate was prepared by chlorinating a narrow kerosene cut and alkylating benzene with the resulting keryl chloride. Distillation of the product gave a kerylbenzene which could be sulfonated and neutralized. The surface active agent thus prepared was usually drum dried. Later it was spray dried to give an excellent product which obtained wide acceptance in industrial applications. This material, however, did not make an appreciable impression on the consumer market. The product required extensive purification to avoid poor color and odor. The large soap manufacturers were more interested at that time in the alkyl sulfate type of product.

Shortly after World War II a new type of alkyl benzene was introduced. This was based on propylene polymer, primarily a tetra propylene, made available by modification of the catalytic polymerization plants. These plants, popularly known as Cat-Poly plants, were built during the war to manufacture polymer gasoline.

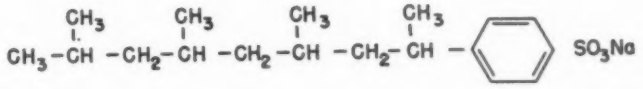
FIG. I

HYPOTHETICAL STRUCTURES

KERYLBENZENE SULFONATE



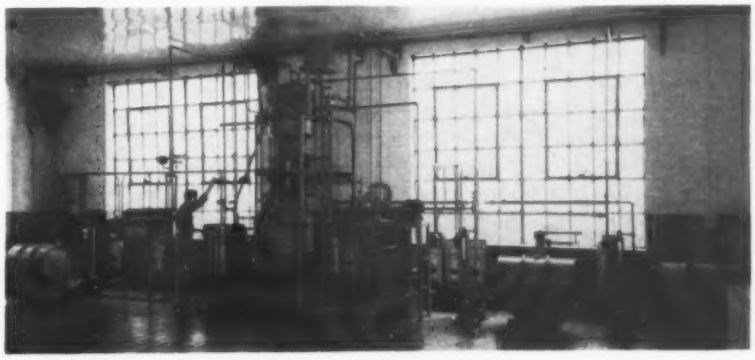
POLYPROPYLBENZENE SULFONATE



These units operated with a solid phosphoric acid catalyst or with a phosphoric acid wetted quartz chip catalyst. The polymer, after fractionation to the proper boiling range, is reacted with benzene using HF, $AlCl_3$ or sulfuric acid catalyst. The alkylated product, again carefully fractionated, is the so-called dodecylbenzene of commerce. Sulfonated, neutralized, built, and dried, this detergent alkylate forms the basis for much of the synthetic detergent sold today to the housewife. I would like to trace briefly the commercial chemical development of this product.

Pioneering work by L. H. Flett and others had generally established that, to obtain proper solubility characteristics, satisfactory wetting speeds and detergency, a side chain of approximately 12 carbon atoms on benzene gave a sulfonating stock of the correct properties. This then was the basis for choice of a propylene tetramer as the source of the alkyl side chain. Figure I shows a hypothetical structure for kerylbenzene

Figure II. Pilot scale customer demonstration facility at Continental's Baltimore laboratory to help detergent manufacturer work out sulfonation and neutralization techniques.



* Paper presented during the fall meeting of the Commercial Chemical Development Association, Nov. 1, 1956, in Cincinnati.

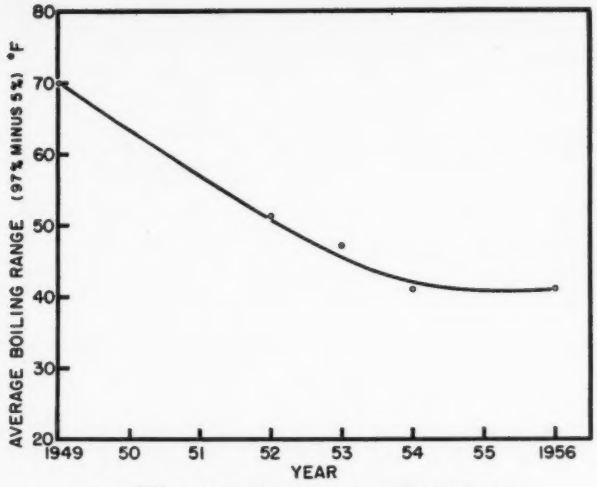


FIG. III AVERAGE BOILING RANGE OF COMMERCIAL DODECYLBENZENES

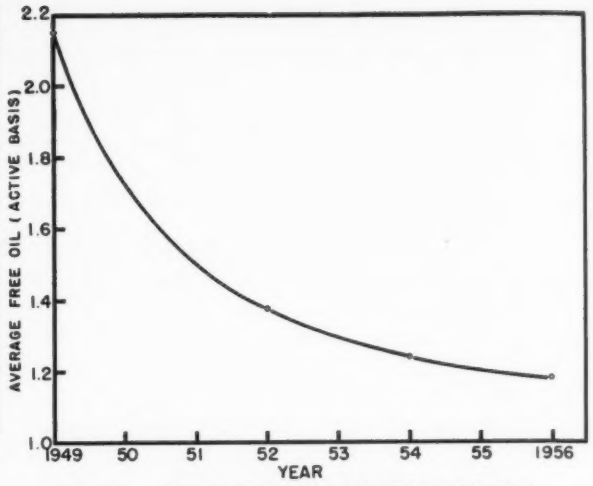


FIG. IV AVERAGE UNSULFONATED RESIDUE OF COMMERCIAL DODECYLBENZENES

sulfonate. These structures are, of course, highly idealized. In kerylbenzene, the phenyl group occupies random positions along the chain. In addition, there are some branched structures in the kerosene fraction used and this branching would show up in the final product. The structure given for the polypropyl side chain corresponds to the head-to-tail polymer which is the most simple structure possible. Actually, the side chain is even more branched than indicated here. A further complication is that both of the starting materials, kerosene or dodecene, are distillation cuts corresponding to an average of 12 carbon atoms, containing small amounts of lower and higher molecular weights. Flett had been working with kerosene fractions which are relatively straight chain, whereas the propylene polymers are obviously branched in nature. Thus, the first step was to determine the boiling range of the propylene polymer to be utilized and, of course, the boiling range of the alkylate. In general, the lower the boiling range of the product the more water-soluble its sulfonate is. Economically speaking, the supplier strives for as wide a boiling range as possible since this permits utilization of more propylene polymer and results in formation of less low-valued by-products from the alkylation step.

Secondly, sulfonation techniques had to be checked out to find the optimum conditions. Temperature of sulfonation and acid strength are the prime variables. Neutralization of the sulfonic acid thus prepared, after separation of a spent acid layer, presented few problems.

Effectiveness of builders, strengths of active agent to use, and drying techniques then had to be studied before the final product was fully developed. Let's now look at each of these steps separately to see by whom and how each was carried out.

Preparation of the hydrocarbon product itself was obviously done by the supplier. Checking out yield data and economies of various boiling ranges of polymers and alkylates was also the function of the producer. In the early days the dodecylbenzene manufacturer developed sulfonating techniques independently; but, of course, the soap manufacturer had been sulfating alcohols, so that he too contributed to this phase of development. In some cases, the detergent alkylate supplier has found it very advantageous to provide customer demonstration facilities to help the detergent manufacturer work out proper sulfonation and neutralization techniques. This was particularly true for the smaller detergent

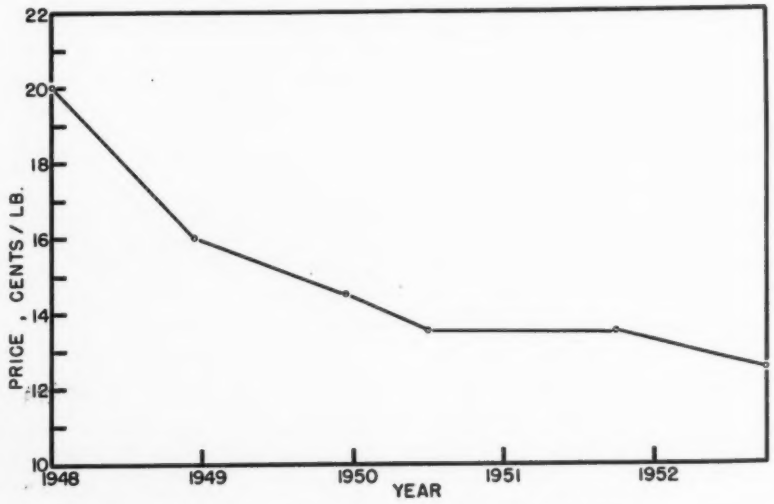


FIG. V PRICE HISTORY OF DODECYLBENZENE

FIG. VI

TYPICAL HEAVY DUTY FORMULATION

SODIUM ALKYLARYL SULFONATE AND SODIUM FATTY ALCOHOL SULFATE	22-35 %
SODIUM PHOSPHATES (T.S.D.P., S.T.P.P. & $NaHPO_4$)	37-48 %
SODIUM SILICATES	5 - 9 %
SODIUM SULFATE	12 - 19%
SODIUM CARBOXYMETHYL CELLULOSE	0.5 %
MOISTURE	5 %

FIG. VII

TYPICAL LIGHT DUTY LIQUID

ALKYLARYL SULFONATE AND/OR FATTY ALCOHOL SULFATE	17-24 %
ALKYLPHENYL POLYETHER GLYCOL (OR IT'S SULFATE)	10 - 13 %
ALKANOLAMIDE	10 - 15 %
ETHYL ALCOHOL	12 - 20%
WATER	30 - 50%

manufacturers who had not at this time developed sufficient know-how in these processes. Figure II shows a pilot scale customer demonstration facility which our Baltimore laboratory uses for this purpose.

Product Evaluation

EVALUATION of the end product and development of the optimum built formulation has been handled primarily by the detergent manufacturers. The detergent alkylate supplier is rather remote from the marketing of the final product and must depend to a large degree on the detergent manufacturer to keep him advised of any changes in the detergent alkylate which are necessary to meet the requirements of particular uses. Because of his participation in the marketing of the finished product the detergent manufacturer is keenly aware of quality problems and is constantly working with his suppliers in an effort to obtain better quality detergent alkylate. Figures III, IV, and V show how the dodecylbenzene suppliers have met this challenge.

Figure III shows the average spread between the 97 percent point and the five percent point in Engler type distillation for all commercial dodecylbenzenes during the period since 1949. In 1949 the average was 70°F. Immediately following this there was a decided narrowing in boiling range with some further narrowing in later years. At the present time the boiling range spread has leveled off at an average of about 41°F.

The prime reason for narrowing the boiling range was to achieve improvements in odor, color and free oil of the sulfonate. Figure IV shows how the reduction in free oil content of the sulfonate has paralleled narrowing of the boiling range. These average free oils were determined on sulfonate slurries from all the commerically available dodecylbenzenes. The dried sulfonates would, of course, contain only about half this amount of free oil. Along with the reduction in free oil, a corresponding improvement in odor and color has been achieved.

This narrowing of the boiling range has meant that the dodecylbenzene supplier has been forced to sacrifice yield to achieve quality. This loss in yield has been partially offset by technological improvements. Figure V shows that in spite of reduced yields because of narrower boiling ranges and in spite of increased operating costs, the suppliers of dodecylbenzene have been able to offer an improved hydrocarbon at steadily decreasing price.

Reduction in free oil, color, and odor is certainly desirable in connection with customer acceptance in household use. These improvements, however, have not appreciably affected the performance of dodecylbenzene sulfonate with regard to wetting, foam, or detergency. Improvements in these latter properties have resulted primarily from better formulations.

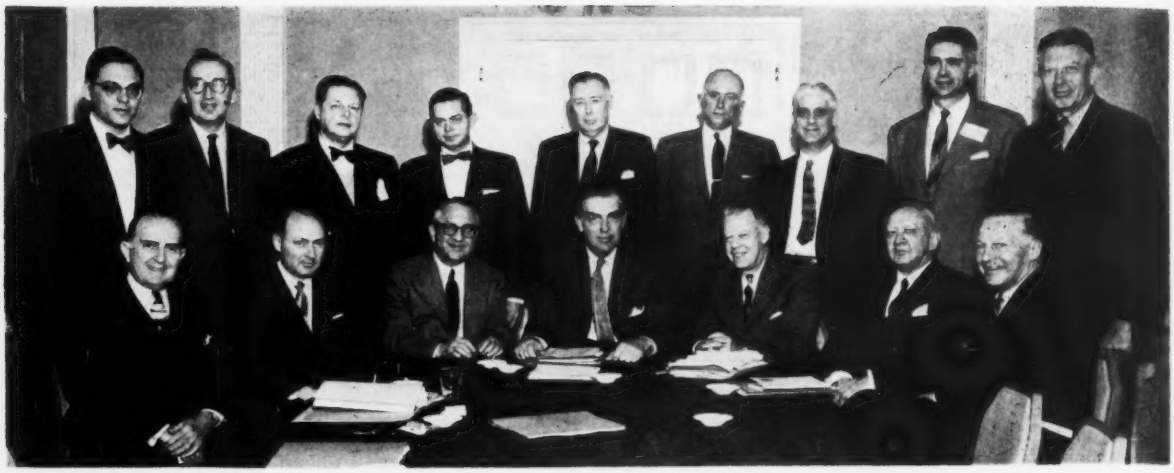
Figure VI shows the average composition of heavy-duty, dried detergents. Phosphates are added to improve detergency and to control alkalinity; fatty alkanol amides are added to improve foam; and sodium carboxymethyl cellulose is added to prevent soil redeposition. In addition to the ingredients shown here, these formulations frequently contain optical bleaches which fluoresce in the visible range to mask undesirable yellow tints in laundered clothes.

(*Turn to Page* 118)

FIG. VIII

TYPICAL PROPERTIES OF SULFONATES PRODUCED WITH VARIOUS SULFONATING AGENTS

	100.8 % H_2SO_4	105 % H_2SO_4	SO_3
MINIMUM PER CENT $NaSO_4$ (BASED ON ACTIVE)	9 - 10	9 - 10	2
KLETT COLOR (4% SOLUTION)	30	30	60



First meeting of the newly elected officers and directors of the Soap Association on Jan. 25 during 30th annual meeting in New York. Standing left to right, directors: Earl Brenn, Huntington Laboratories, Inc.; George W. Huldrum, Shell Chemical Corp.; E. H. Bluman, Harchem Division, Wallace & Tiernan, Inc., J. Mayberry, R. R. Street & Co.; F. B. Patton, Armour & Co.; J. L. Christian, Monsanto Chemical Co.; George Hallenbeck, Swift & Co., representing E. A. Moss; Frank J. Pollnow, Jr., Vestal Laboratories, Inc., and N. H. McElroy, Procter & Gamble Co. Sitting: W. L. Sims, II, Colgate-Palmolive Co.; A. K. Forthmann, Los Angeles Soap Co., vice-president for the far west; A. W. Schubert, Emery Industries, Inc., vice-president for the middle west; E. B. Osborn, Economics Laboratory, Inc., president; W. A. Burkhart, Lever Brothers Co., vice-president for the east; N. S. Dahl, John T. Stanley Co., treasurer, and Roy W. Peet, manager, Soap Association.

Soap Assn. Reelects E. B. Osborn

REELECTION of E. B. Osborn, head of Economics Laboratory, Inc., as president and renaming of all other officers of the Association of American Soap & Glycerine Producers, was among the highlights of the 30th annual meeting of the association. The three day annual get-together was held Jan. 23-25 at the Waldorf-Astoria Hotel, New York. In addition to talks on the general business outlook and technical papers given at meetings of the association's three divisions, there were discussions of the problems of water and sewage treatment, a report on grocery store soap and detergent sales and review of the role of research.

A letter requesting the discontinuance of committee K-63 of the American Standards Assn. attempting to set performance standards for cleaning and maintenance products was read at the Industrial Division meeting and approval was voted to send the letter to the American Standards Assn. The ASA has been meeting with industry representatives for the past year in an effort to establish standards to be used by the American Hotel Association. The Industrial Division also voted to spend over $30,000 to promote the sale of industrial cleaning products. Part of the fund would be used to reprint the book, "The Prevention of Occupational Skin Diseases" by Dr. Louis Schwartz. The booklet was first published in 1955, and the supply of 25,000 copies is exhausted. In addition, final approval was given during the division's meeting to the book on maintenance of plants and equipment. A third portion of the appropriation will be used for educational and public relations work designed to encourage industrial sanitation.

E. H. Bluman, chairman of Fatty Acid Division, presiding at luncheon, Jan. 23.

Industrial Division

ON Wednesday morning, January 23, the Industrial Division held meetings of the skin cleaning, the building equipment maintenance, and the fabric cleaning groups. Under the chairmanship of E. Randa, soap division of Armour & Co., the skin cleaning group was told about the association's campaign to combat dermatitis. The publicity program scheduled to support this campaign in 1957 was described by Henry T. Rockwell, Jones & Brakely, Inc., New York. The building and equipment maintenance group, with E. Brenn of Huntington Laboratories, Inc., as chairman, reviewed a proposed handbook.

A panel on "Detergent Practices as Affected by New Textile Fibers, Fabrics, and Finishes" was held by the fabric cleaning group

W. A. Burkhart, president, Lever Brothers Co.; William McChesney Martin, Jr., board chairman, Federal Reserve System, luncheon speaker, Jan. 24, and Roy W. Peet, manager of the Soap Association.

Wheeler McMillan, vice-president, Farm Journal, Inc., luncheon speaker, Jan. 23, with T. J. Wrocklage, head of the industrial soap division of Procter & Gamble Co. and vice-chairman of Industrial Soap. Div.

with Jay C. Harris of Monsanto Chemical Co. in the chair. First panelist was Doris Hanson, associate editor of household equipment on *McCall's Magazine*. Miss Hanson, speaking on "Current Trends in Home Laundering," quoted from a recent article in *McCall's*. She discussed the trend toward cold water for washing and rinsing. Miss Hanson said that the "wash and wear" characteristics of most man-made fibers are better preserved in washing with water of as low as 60°F. since compression of the fibers in rapid spinning in this temperature does not set wrinkles in the fabric as it does at higher temperatures. Since these fibers do not absorb soil in the same fashion as the natural fibers it may be possible to remove soil adequately in most cases at cold water temperatures with good detergents. Implications for the detergent manufacturer: development of detergents which are effective at low temperatures and added importance for liquids, since detergent solubility is vital in cold water washing.

The second trend is towards shortened cycles and slower speeds in modern washers. Because the newer fibers do not absorb moisture to the same degree as natural fibers, high speeds and long spins in washing machines are not required. Furthermore, some of these fabrics are adversely affected by lengthy spins.

Use of rinse additives is the third trend. A dispenser for the incorporation of "Calgon" in the rinse has been introduced in one washer and another firm has recently developed a device which adds a liquid rinsing aid and fabric softener. Other fabric softeners are simply added to the rinse in machine or manual washing. In addition to softening the hand of the fabric they act as antistatics.

Increased blending of fibers is the fourth trend, which calls for versatile detergents and laundry products, safe and effective on as many types of fibers as possible. The fifth and last trend is the enhanced importance of the automatic dryer.

The next panel speaker, H. C. Borghetty of Rohm & Haas Co., described the "Effect of Finishes in Relation to Detergency." Heat setting, a mechanical operation, has taken the place in new man-made fibers of chemical finishing techniques applied to rayons and cottons. This change however has not brought major modifications in the laundering and dry cleaning of the new textiles. In natural/synthetic blends finishing resins are used which are similar to those applied to the natural fiber alone and which do not call for any change in treatment. Static build-up in hydrophobic synthetics is a problem, which may be solved by antistatic finishes. These are usually not very stable to repeated laundering and an antistat should be added to the rinse. Hydrophobic fibers tend to collect greasy soils, a tendency aggravated by water

(*Turn to Page* 62)

E. W. Wilson, vice-president of Armour & Co. with Mack Hollis, U.S. Public Health Service; E. B. Osborn, Economics Laboratory, Inc., AASGP president and Dr. Leona Baumgartner, Commissioner of Health City of New York; Dr. L. E. Burney, Surgeon General, U. S. Department of Health, Education and Welfare, luncheon speaker, January 25, and Neil H. McElroy, president of Procter & Gamble.

DOW

In their brief but exciting history, chelating agents have encountered reactions ranging from scoffs and disbelief to overzealous exaggeration about their application. But the air is clearing. Already they are serving as important tools in many industrial processes. This is the beginning of a series on chelating agents designed to further clarify what they are, what they will do—and won't do.

The Chemistry of Chelation: Part I

Chelation defined · Example of the reaction · Variety of applications · Future of chelating agents

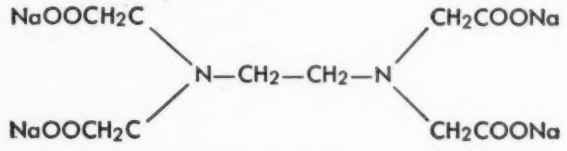
Polymerization of synthetic rubber controlled . . . soap kept white and sparkling on the dealer's shelf . . . textiles bleached and dyed with permanent uniform colors . . . pharmaceuticals stabilized. Unrelated reactions? Certainly. However, all are accomplished by a group of closely related chemicals called chelating agents. How do they work? Well, it's not magic, but chemistry—in a way, fairly basic chemistry. But let's begin at the beginning.

What Is Chelation?

Let's look at the word chelation. It is derived from the Greek word *Kelos* which means "claw." Simply stated, a chelate is a claw which holds a metallic ion inactive in solution. Chemically stated, chelation is a chemical reaction in which polyvalent metallic ions are reacted with organic reagents (chelating agents) to chemically inactivate these polyvalent metallic ions in the form of an extremely stable, water-soluble chelate.

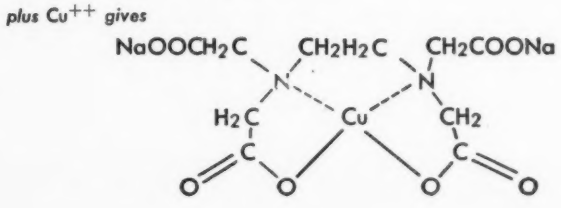
Typical Reaction

If we examine a typical reaction, the process of chelation becomes quite clear. Let us take, for example, the chemical structure of Versene®, one of the Dow chelating agents.



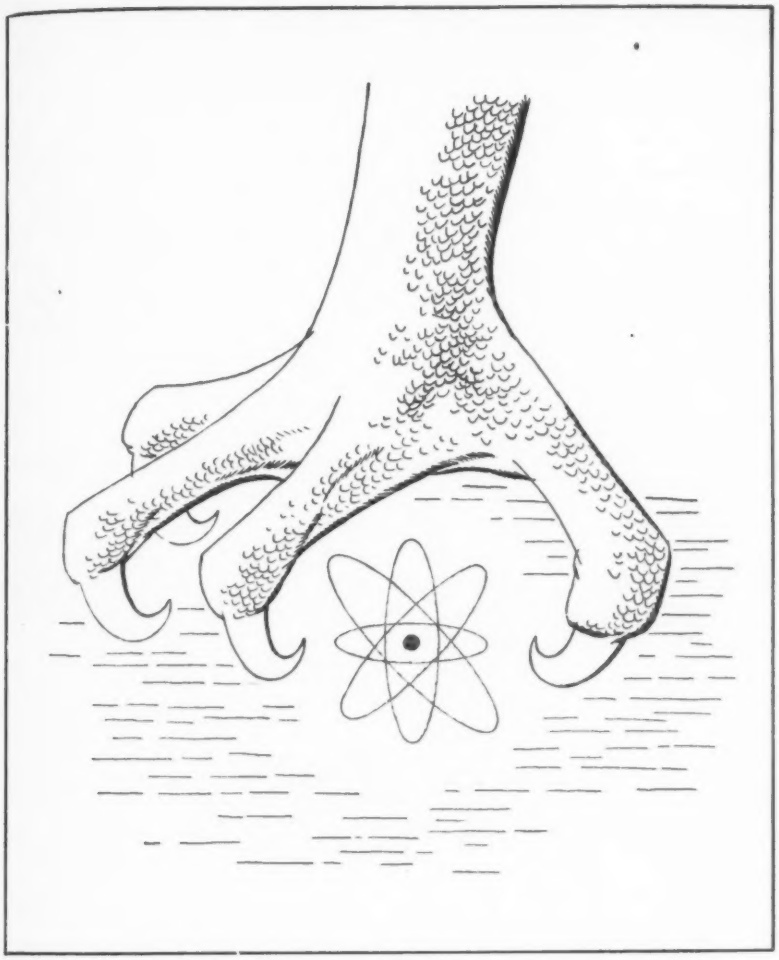
Versene

Now, if we place the Versene in a solution which contains free polyvalent ions of copper (Cu^{++}), the following is the result:



Versene Copper Chelate

The resultant compound is Versene copper chelate. The copper ion has become a member of an inner ring structure in the molecule. The result?



It is inactivated. It cannot react with soap to cause darkening and stain during storage.

It can't cause breakdown of pharmaceuticals. It can't cause any trouble anywhere because it is locked in the Versene claw. It will stay locked in unless it is desired to reverse the process. This reverse action is used in polymerization of synthetic rubber—ions of iron being released at a predetermined rate by the chelate.

Variety of Applications

The most important thing, however, is that this "claw" property of chelating agents such as Versene makes it possible to solve a multitude of processing problems in industry. They've been used in tanning leather and tenderizing peas.

They can descale boilers, soften water and cure acute lead poisoning. The number of current industrial and medical applications is large, but the potential in unexplored areas is enormous.

And the Future?

The future of these products will hinge on the imagination and insight of chemists and engineers, of production men and purchasing agents, in nearly every industry. Wherever metal contamination poses a problem or wherever controlled introduction of metal ions is desirable, these chemicals warrant investigation.

Versene and other Dow chelating agents won't solve them all. Chelation is not a panacea. It will work chemically in some areas—it will fail in others. However, it is Dow's intention to assist in every way in the uncovering of processes in which chelating agents can be profitably used. Inquiries on your company letterhead will be handled with dispatch. We will be pleased to provide information and technical assistance. Write to Technical Service and Development, Dept. CA 900A, THE DOW CHEMICAL COMPANY, Midland, Michigan.

The next three topics in this series

PART II — The Versene and Versenol® series of Dow chelating agents (what they are, strength and stability features—Versenol lower cost, less strength). Also—how chelating agents are specified (product performance versus chemical composition).

PART III — Specific chelating agents for specific applications. Formulations of various kinds (dilute or concentrated agent depending on product—powdered form for solid cleaning compounds—Versene vs. Versenol for iron removal vs. softening water).

PART IV — Further discussion of the use of chelating agents in the formulation of cleaning compounds (production economies possible—improvement of product: in appearance, in performance).

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*Celite is Johns-Manville's registered trade mark for its diatomaceous silica products

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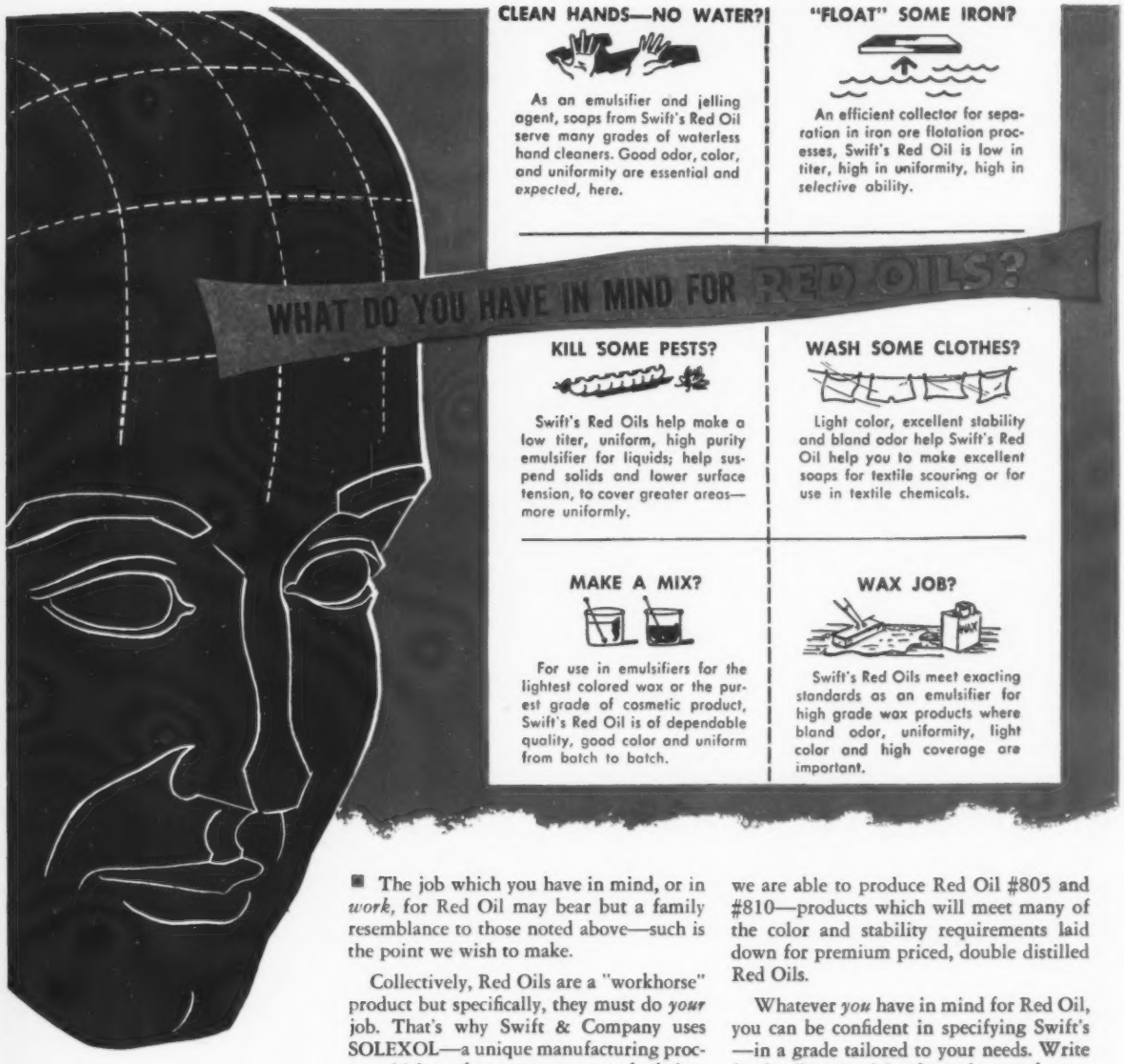
Johns-Manville CELITE FILTER AIDS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Light color, excellent stability and bland odor help Swift's Red Oil help you to make excellent soaps for textile scouring or for use in textile chemicals.
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Swift's Red Oils meet exacting standards as an emulsifier for high grade wax products where bland odor, uniformity, light color and high coverage are important.

■ The job which you have in mind, or in *work*, for Red Oil may bear but a family resemblance to those noted above—such is the point we wish to make.

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Effective over wide range of water hardness and pH

Excellent wetting agent and emulsifier

Extremely stable in presence of acids, alkalis, inorganic salts including heavy metal salts

A powerful detergent

Suggested uses—dairy detergents and milkstone remover, car wash, antiseptic sanitizer, paint and woodwork cleaner

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(100% active lauric acid alkylolamide condensate)

Superior foam stabilizer for anionics

Remarkable thickening action over a wide range of concentrations

Non-corrosive—can be stored indefinitely

Excellent detergent and wetter and shows remarkable synergism when blended with anionics or nonionics

Suggested uses—liquid dishwasher, clear liquid shampoo, bubble bath

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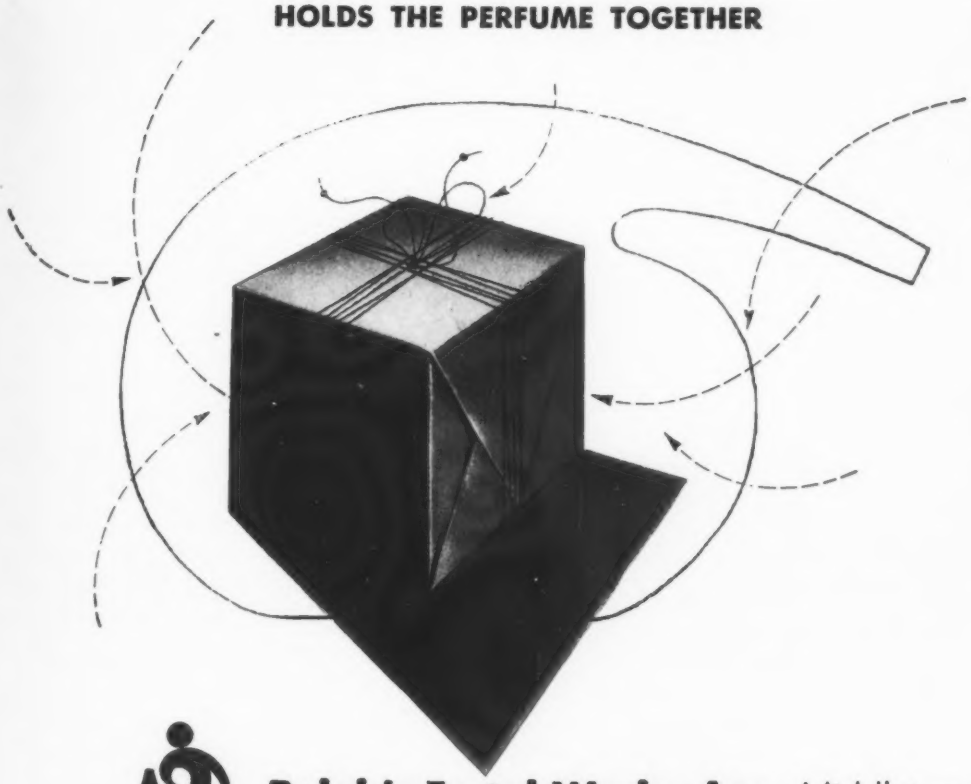
Useful addition to present standard fixatives

Does not discolor perfumes, creams, soaps, and other cosmetic preparations

Like a string around a package, it...

HOLDS THE PERFUME TOGETHER



Polak's Frutal Works, Inc., Middletown, New York

*Domestic and Foreign Patents applied for.

repellent finishes. Removal of these soils can be facilitated by spot washing with non-ionics.

"Textile Mill Detergent Practices" were presented by the third panelist, George M. Gantz of Antara Chemicals Division, General Aniline & Film Corp. He pointed out that most of the synthetic fibers are scoured with a syndet and mild alkali. With few exceptions their advent has simplified textile mill detergency practices compared with the requirements of natural fibers.

Following the panel on detergent practices the Industrial Division held a business meeting at which it reelected F. J. Pollnow Jr. of Vestal Laboratories, Inc., as chairman and T. J. Wrocklage of Procter & Gamble Co. as vice-chairman of the division.

Concurrently with the session of the Industrial Division, business meetings were held by the Technical Advisory Steering Committee and by the Fatty Acid Division. The latter elected E. H. Bluman of the Harchem division of Wallace & Tiernan as chairman and A. R. Besks of Darling & Co. as vice-chairman, and the following committee members: K. K. Boyd, Emery Industries, Inc.; F. C. Haas, Archer-Daniels-Midland Co.; W. C. Hardesty, Acme Hardesty Co.; J. M. Hoerner, Armour & Co.; F. E. Lacey, Swift & Co.; and W. Mitchell, General Mills, Inc.

The divisional meetings were followed by a joint luncheon presided over by E. H. Bluman. The luncheon speaker, Wheeler McMillen, *Farm Journal*, Inc., presented a talk on "More Government Utilization Research." Mr. McMillen is executive director of the President's Bi-partisan Commission on Increased Industrial Use of Agricultural Products.

The general meeting of the Fatty Acid Division heard four papers the afternoon of Jan. 23. Herman W. Zabel, Roger Williams Technical and Economic Services, Inc., Princeton, N. J., presented the "Exclusion Chart – New Measuring Tool for Chemical Market Analysis." The exclusion chart is a plot of existing price-volume relationships for various end-uses. Unless a product for a given use can be provided for less than a certain price, 32 cents per pound for surface active agents in 1955 for instance, the product is excluded from enjoying sales of more than about four million pounds a year, he stated.

Fabric Cleaning Group of Industrial Division of the Soap Association heard panel members above, Jan. 23, including, left to right: George M. Gantz, supervisor, textile section, technical department, Antara Chemicals Division, General Aniline & Film Corp., speaking; Jay Harris, Monsanto Chemical Co., group chairman; Doris Hanson, assistant editor, household equipment, McCall's magazine, and H. C. Borghetty, manager, textile development, Rohm and Haas Co., Philadelphia.

A paper, "Research Planning and Tomorrow's Profits," by W. L. Swager and E. E. McSweeney, Battelle Memorial Institute, was read by Mr. Swager. Long range research and development planning the authors indicated must be based on five basic steps if it is to yield profits: 1. evaluate the needs of the business; 2. determine related technical objectives; 3. define possible projects to meet the technical objectives; 4. compare the alternatives; and 5. program selection and budgeting. Research planning must be a team effort with management, production and research personnel coordinating their contributions. Choice of research area is of supreme importance to the ultimate results.

Ralph H. Potts, Armour & Co., reported on "European Developments in Fatty Acid Production." Immediately after World War II most European fatty acid industries turned to American equipment and "know-how" for the conversion of war damaged plants into efficient and competitive units. Now European scientists and engineers are once more contributing their share of invention and developments. While fractional distillation units still account for only a small amount of the total fatty acid distillation capacity in Europe today, most of the recently built stills are provided with fractionating columns. In German trade journals a multiple column still is being advertised which has a pitch removal column, followed by three fractionating columns for the production of four fractions and residue simultaneously.

In Switzerland a new still has been developed, especially designed for heat sensitive and high molecular weight materials. Having outlined new developments in separation by crystallization and various methods of fatty alcohol production, Mr. Potts concluded his talk by showing slides of European production facilities.

R. H. Young of Davies-Young Soap Co. concluded the Jan. 23 afternoon session with a brief talk entitled "Trends in Industrial Soaps Affecting Fatty Acid Usage." Davies-Young's business rests on three main types of products, he said: 1. items derived from fatty acids only; 2. combinations of fatty acid based materials with materials derived from whole glyceride; 3. products based on synthetics. In 1950 the firm made 45.2 percent fatty acid derived products; 54.2

Turn to Page 197)

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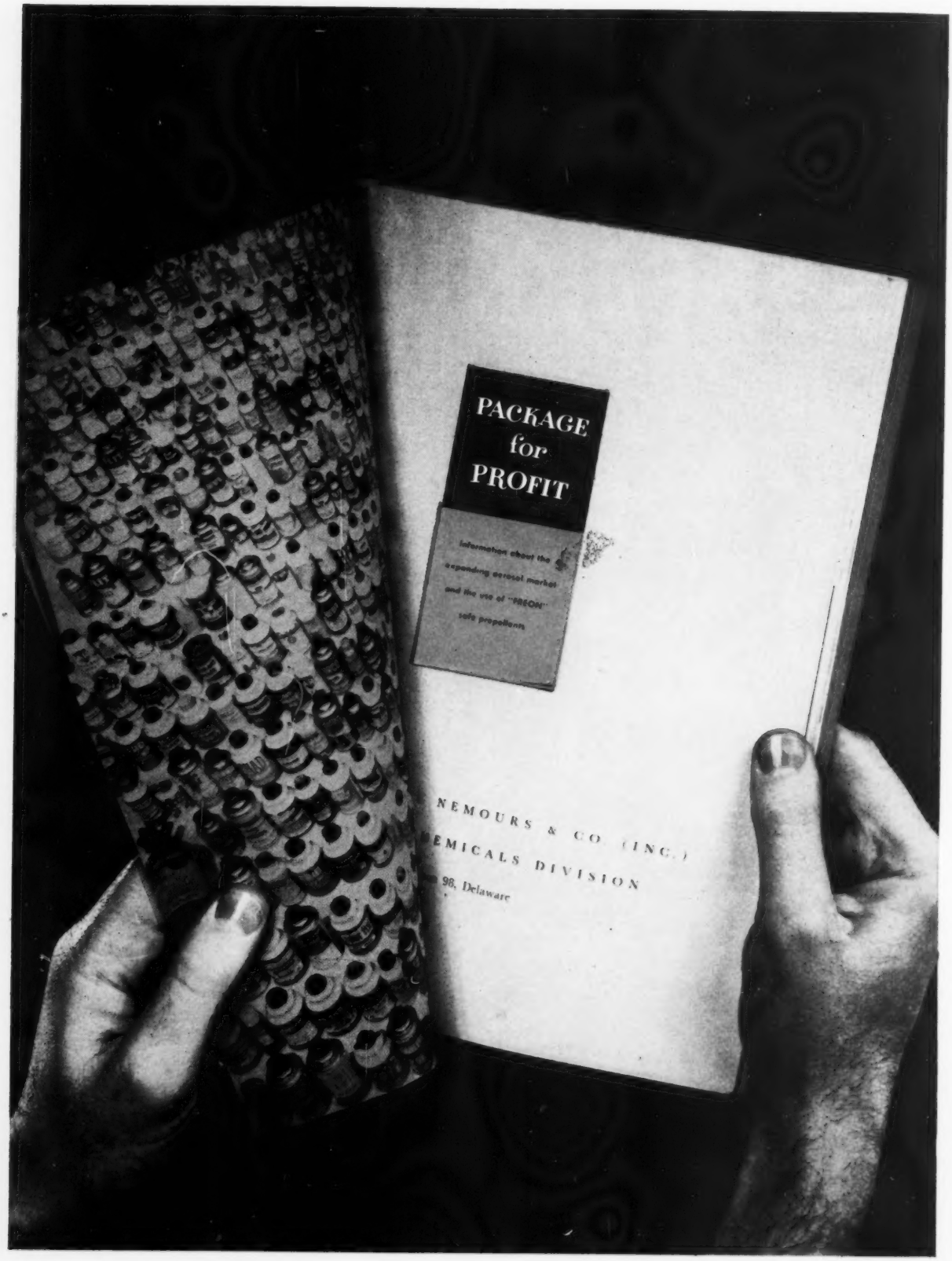
Dr. Morton Beroza, U.S. Department of Agriculture scientist, who discovered and developed new pyrethrins synergist which is now being produced commercially in pilot plant quantities by Shulton, Inc., Clifton, N.J., under trade name "Sesoxane".

New up-to-date information from



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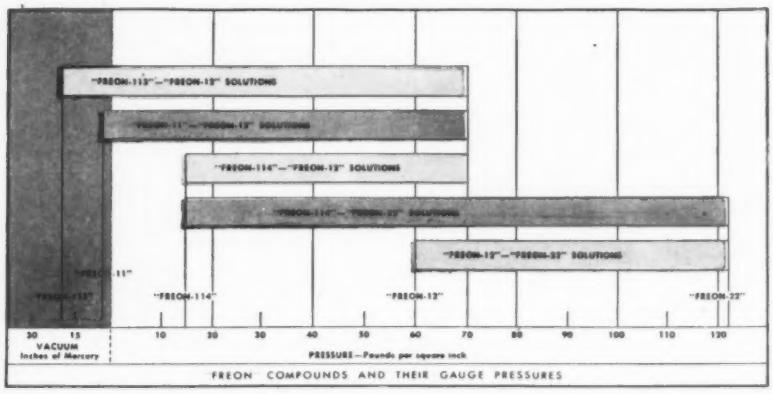
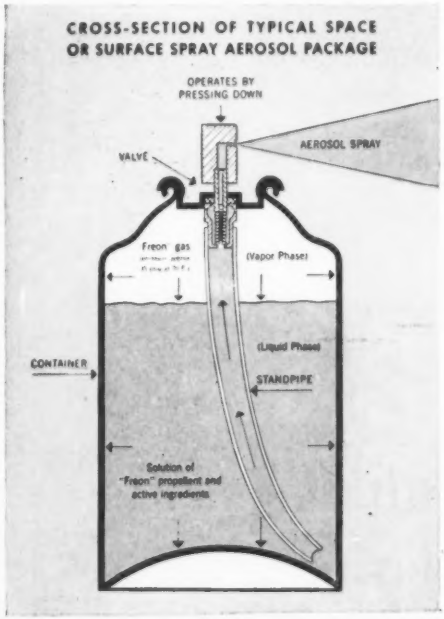


Technical data on "Freon" propellents—including information to help you select the best propellent for your aerosol. Chart above, taken from Du Pont's new "*Package for Profit*" shows pressure ranges available with various "Freon" propellent solutions. "*Package for Profit*" contains an Appendix with lists of suppliers and loaders who can help you put your product in an aerosol. The Appendix also includes a bibliography of literature and summary of patents on aerosols. Send for your copy of "*Package for Profit*" today.

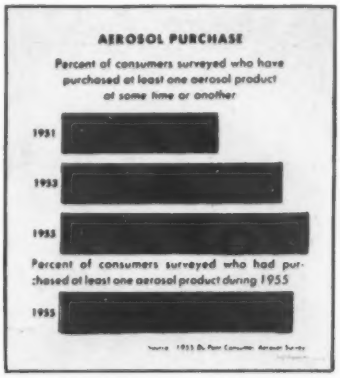
Forty-six pages of facts give you comprehensive information about the expanding aerosol market and the use of "Freon"* safe propellents. It's all in Du Pont's new edition of "*Package for Profit.*"

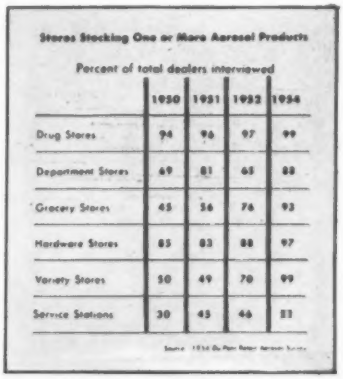
Publication of this handbook of aerosols is another of the many Du Pont services designed to help you get the most from "Freon" propellents. "Freon" propellents are ideal for aerosols, because they are safe — nonflammable, nonexplosive, virtually nontoxic. "Freon" compounds are backed by more than 25 years of Du Pont technical and manufacturing leadership.

For your copy of the new "*Package for Profit,*" just write and tell us what your interest is in aerosols. Write on your company letterhead to E. I. du Pont de Nemours & Co. (Inc.), Div. 191, Room 2420-11, Nemours Building, Wilmington 98, Delaware.



Principles of operation for the basic aerosol types are outlined in the new booklet "*Package for Profit.*" General data on aerosol propellents, containers, valves, formulation and testing are covered. Specific formulations for many of the better-known aerosols are also given. "*Package for Profit*" tells how you can make use of Du Pont technical service to help with your aerosol formulation and testing.


AEROSOL PURCHASE
Percent of consumers surveyed who have purchased at least one aerosol product at some time or another
1951
1953
1955
Percent of consumers surveyed who had purchased at least one aerosol product during 1955
1955



	1950	1951	1952	1954
Drug Stores	94	96	97	99
Department Stores	69	81	65	88
Grocery Stores	45	56	76	93
Hardware Stores	85	83	88	97
Variety Stores	50	49	70	99
Service Stations	30	45	46	81

The aerosol market—*past, present* and *future.* Facts gathered from Du Pont's continuing annual market research are outlined for you in the new "*Package for Profit.*" Charts above, taken from Du Pont's new edition, show growth for aerosols over the years by per cent of people having purchased and by per cent of dealers stocking in various types of stores. "*Package for Profit*" tells how you can get summaries of Du Pont's market research for detailed study.

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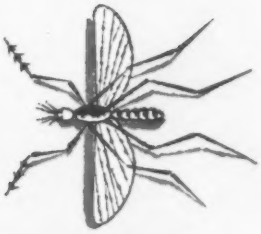

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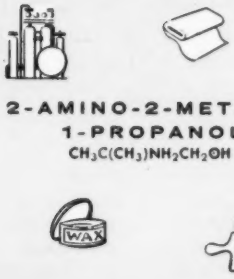
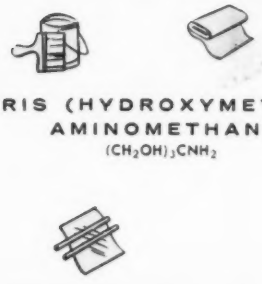
$CH_3CHNO_2CH_3$



2-AMINO-2-METHYL-1-PROPANOL
$CH_3C(CH_3)NH_2CH_2OH$



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$(CH_2OH)_3CNH_2$

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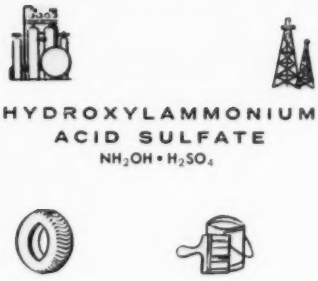
2-AMINO-2-METHYL-1, 3-PROPANEDIOL
$CH_2OHC(CH_3)NH_2CH_2OH$



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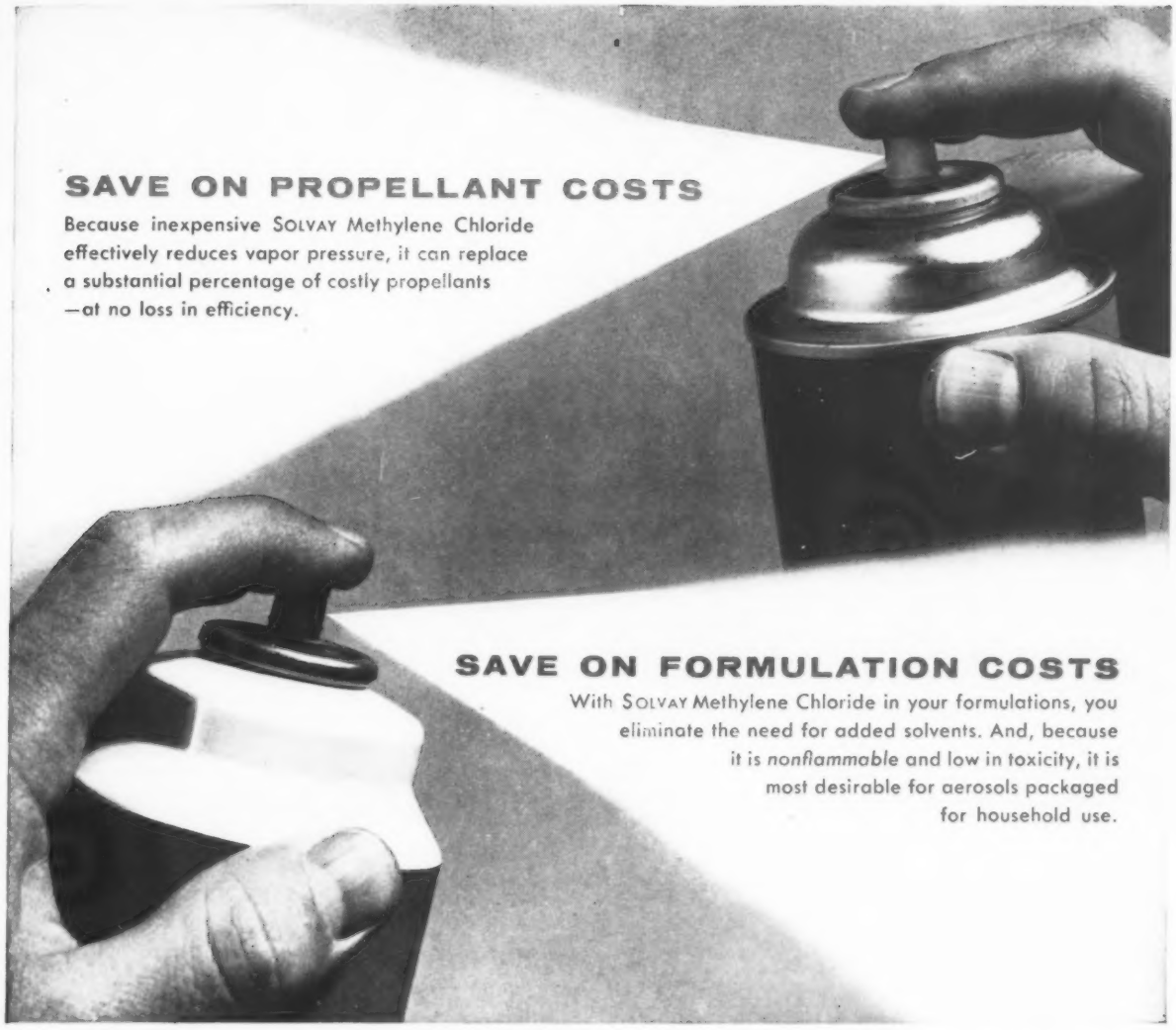

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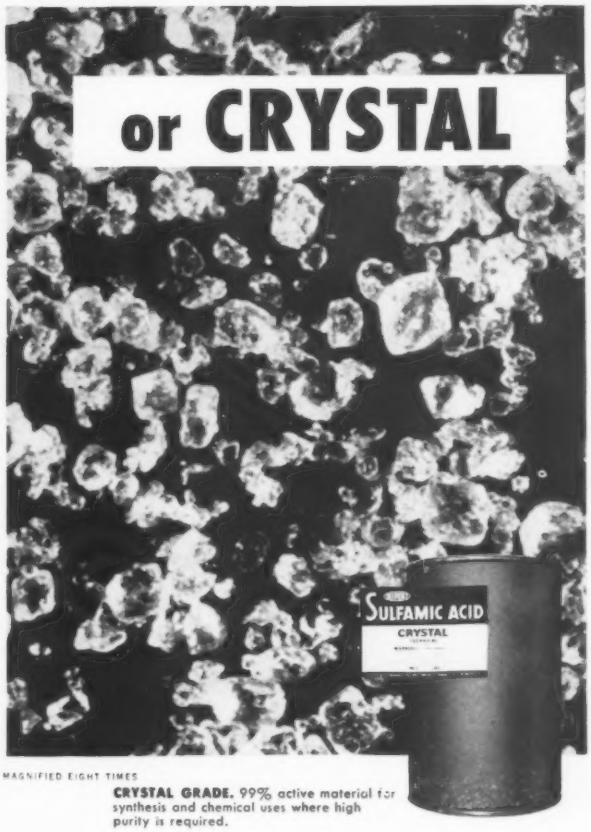

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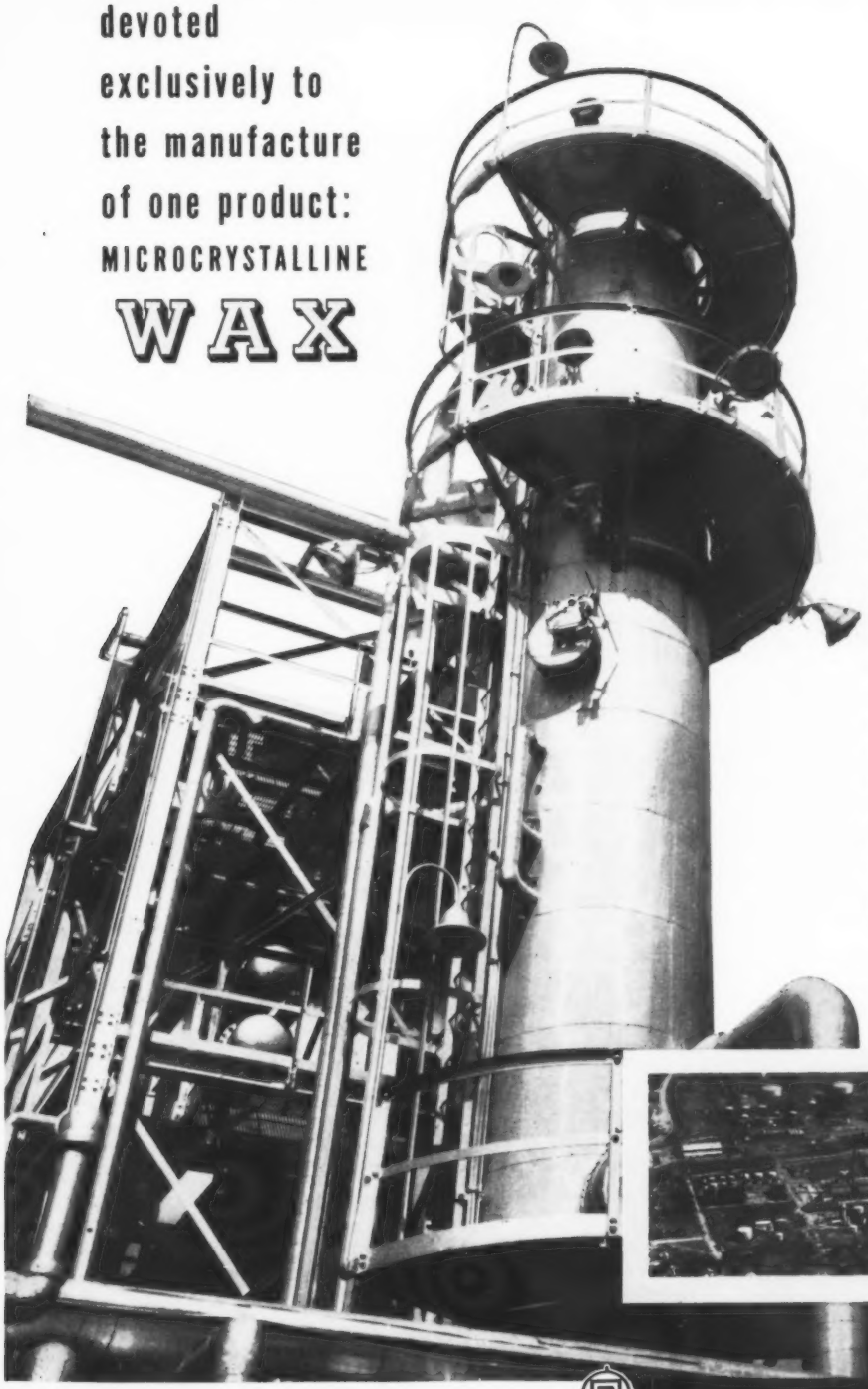

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Better Insecticides

MINNEAPOLIS, MINNESOTA

Author John H. Fales, an entomologist of the U. S. Department of Agriculture, Beltsville, evaluates effectiveness of new synergist.

Dr. Morton Beroza of the U. S. Department of Agriculture, Beltsville, Md., is discoverer of "Sesoxane," new synergist for pyrethrins.

New Pyrethrum Synergist

Evaluation of a 3,4-methylenedioxyphenyl acetal as synergist for pyrethrins and allethrin against house flies, mosquitoes, roaches, Japanese beetles

By J. H. Fales, O. F. Bodenstein, and Morton Beroza*

Entomology Research Branch, Agricultural Research Service
U. S. Department of Agriculture

TESTS evaluating the synergistic activity of 2-(2-ethoxyethoxy) ethyl 3,4-methylenedioxyphenyl acetal of acetaldehyde with pyrethrins or allethrin in comparison with piperonyl butoxide or sulfoxide are reported in this paper. The compound, hereafter called ENT-20871, is identical with "Sesoxane" for which Shulton, Inc., recently announced a commercially feasible synthesis.

Sixty-three of the 3,4-methylenedioxyphenyl derivatives synthesized by Beroza (1) were tested by Gersdorff *et al.* (2) against house flies (*Musca domestica L.*) by the turntable method. Fales *et al.* (3) reported on eight of these derivatives that were selected for further evaluation by the Peet-Grady method. The 2-(2-ethoxyethoxy) ethyl 3,4-methylenedioxyphenyl acetal of acetaldehyde, was shown to be at least equal to piperonyl butoxide as a synergist with either pyrethrins or allethrin. The present paper reports on further tests evaluating ENT-20871 as a synergist against house flies, mosquitoes, and cockroaches in sprays and aerosols. A pyrethrins-DDT aerosol formulation was also tested against Japanese beetles (*Popillia japonica* Newm.).

Procedure

ALL the tests except those against cockroaches were made in a Peet-Grady chamber. The spray tests against house flies and mosquitoes followed the Peet-Grady method of the Chemical Specialties Manufacturers Association (4) except when the dosages had to be reduced, especially in the tests against mosquitoes. The Official Test Insecticide (OTI), which contains pyrethrins 1 mg./ml., was used as a check in some of the tests. The aerosol tests and the tests against cockroaches were made by methods sponsored by the CSMA (5, 6). The aerosol containers were filled in the laboratory** and the aerosols were dispensed directly into the test chamber.

The house flies and German cockroaches (*Blattella germanica* (L.)) were reared by the usual procedures. The mosquitoes, *Anopheles quadrimaculatus* (Say) and *Culex pipiens* L., were laboratory-reared, the former from eggs shipped by air mail from Orlando, Fla., and the latter from egg rafts collected locally in nature. The

* Paper presented before the 43rd annual meeting, Chemical Specialties Manufacturers Association, Washington, D. C., Dec. 5, 1956.

** By R. A. Fulton of Entomology Research Branch, Agricultural Research Service, U. S. D. A., Beltsville, Md.

Table 1—Comparison of ENT-20871 and piperonyl butoxide as synergists for pyrethrins in sprays; tests against house flies. Pyrethrins 0.4 mg. per milliliter of deodorized kerosene. (5 tests)

Synergist (mg./ml.)	Ratio of insecticide to synergist	% Knockdown in — 5 minutes	10 minutes	% Kill in 1 day
ENT-20871				
0.2	1:0.5	81	92	27
0.4	1:1	85	95	45
0.8	1:2	89	98	73
1.6	1:4	87	96	83
Piperonyl butoxide				
0.2	1:0.5	65	83	21
0.4	1:1	74	88	37
0.8	1:2	80	93	60
1.6	1:4	79	98	77
None (OTI)	—	91	97	25

Table 2—Comparison of ENT-20871 and piperonyl butoxide as synergists for cyclethrin, allethrin, and pyrethrins in sprays; tests against house flies. Insecticides 0.4 mg. and synergist 2.0 mg. per milliliter of deodorized kerosene. (5 tests)

Insecticide	Synergist	% Knockdown in — 5 minutes	10 minutes	% Kill in 1 day
Cyclethrin	None	50	73	12
	ENT-20871	85	98	84
	Piperonyl butoxide	73	97	86
Allethrin	None	68	84	13
	ENT-20871	79	95	75
	Piperonyl butoxide	78	93	52
Pyrethrins	None	69	75	9
	ENT-20871	90	99	93
	Piperonyl butoxide	85	98	86
OTI	—	94	99	40

Japanese beetles were field-collected.

Tests with Sprays

AGAINST house flies. — Fales *et al.* (3) reported the results of a 1:5 ratio of pyrethrins or allethrin to ENT-20871 against house flies. To see if this synergist would perform as well as piperonyl butoxide at several other ratios, the two synergists were compared at ratios of 1:0.5, 1:1, 1:2, and 1:4. Table 1 shows that ENT-20871 was more effective than piperonyl butoxide in kill and in all except one knockdown count.

In another series of tests, mixtures containing cyclethrin, allethrin, and pyrethrins were used. Both materials synergized cyclethrin to about the same degree, although ENT-20871 caused a higher five-minute knockdown (table 2). With allethrin, ENT-20871 caused a much higher kill than piperonyl butoxide, but it was below that obtained with cyclethrin. The best performance was obtained with pyrethrins plus ENT-20871. The pyrethrins-piperonyl butoxide and cyclethrin-ENT-20871 mixtures caused equal knockdown and kill. Both Haynes *et al.* (7) and Gersdorff *et al.* (8) had found that cyclethrin was more readily synergized than allethrin by piperonyl butoxide and sulfoxide.

When ENT-20871 and piperonyl butoxide were compared in the Federal Specification Space Spray (table 3), the two formulations gave similar knockdown and kill. ENT-20871 alone at 2.0 mg./ml. in deodorized kerosene gave 11 percent knockdown in 10 minutes and 28 percent kill in one day. Pyrethrins at 0.4 mg./ml. gave 70 percent knockdown and 8 percent kill in the same observations.

Allethrin and pyrethrum sprays containing ENT-20871 that had been stored in darkness at

Table 3—Comparison of ENT-20871 and piperonyl butoxide as synergists in Federal Specification Space Spray (allethrin 0.15% plus DDT 1% plus Synergist 0.8% plus xylene 1% in deodorized kerosene); tests against houe flies. (3 tests)

Synergist	Spray dosage (ml./1000 cu. ft.)	% Knockdown in— 5 minutes	10 minutes	% Kill in 1 day
Piperonyl butoxide	9.26	41	65	91
ENT-20871	9.26	45	64	86
None (OTI)	55.56	91	97	28

Table 4—Comparison of stored and freshly prepared sprays and aerosols containing either allethrin or pyrethrins plus ENT-20871; tests against house flies. (4 tests with allethrin sprays, 3 tests with other sprays and aerosols)

Insecticide	Months of storage	Dosage per 1000 cu. ft.	% Knockdown in— 5 min.	10 min.	15 min.	% Kill in 1 day
Sprays (Insecticide 0.4 mg. plus synergist 2.0 per milliliter)						
Allethrin	15	55.56 ml.	72	90	—	67
	Fresh	do.	73	94	—	84
Pyrethrins	15	do.	82	95	—	86
	Fresh	do.	91	99	—	89
Aerosols (Insecticide 0.4% plus synergist 2.0%)						
Allethrin (G-1163)	12	3.47 gms.	58	84	95	91
	Fresh	3.00	43	62	78	80
Pyrethrins (G-1162)	12	3.28	58	88	96	95
	Fresh	3.24	37	79	91	87

Table 5—Comparison of ENT-20871 and piperonyl butoxide as synergists for pyrethrins in deodorized kerosene sprays; tests against mosquitoes. Dosage 13.9 ml./1000 cu. ft.

Pyrethrins (mg./ml.)	Synergist (mg./ml.)		% Knockdown in— 5 minutes	10 minutes	% Kill in 1 day Males	Females
	Anopheles quadrimaculatus (5 tests)					
0.1	ENT-20871	0.5	54	78	95	92
	Piperonyl butoxide	0.5	52	69	97	88
0.2	None		60	80	83	59
	Anopheles quadrimaculatus (3 tests)					
0.2	ENT-20871	1.0	69	85	99	99
	Piperonyl butoxide	1.0	70	85	99	98
	None		63	83	89	62
	Culex pipiens (3 tests)					
0.4	ENT-20871	0.8	46	90	92	69
	Piperonyl butoxide	0.8	53	91	95	71
	None		55	91	82	43

Table 6—Comparison of ENT-20871 and piperonyl butoxide as synergists for pyrethrins and allethrin in deodorized kerosene sprays; tests against cockroaches.

Insecticide (mg./ml.)	Synergist (2.0 mg./ml.)	% Dead or Moribund after— 1 day	2 days
	Pyrethrins spray, 0.25 ml. (6 tests)		
0.4	ENT-20871	39	57
	Piperonyl butoxide	30	43
	None	17	24
0.8	None	38	40
1.6	None	62	64
	Allethrin spray, 0.5 ml. (3 tests)		
0.4	ENT-20871	35	38
	Piperonyl butoxide	31	43
	None	24	26
0.8	None	36	42
1.6	None	74	77

room temperature in cork-stoppered bottles for 15 months were compared with freshly made samples. There was only enough material for three or four comparisons. As shown in table 4, the stored allethrin caused less mortality than the fresh, and the stored pyrethrins equal kill and lower knockdown.

Against Mosquitoes.—Sprays containing pyrethrins plus either ENT-20871 or piperonyl butoxide in two concentrations were compared against *Anopheles quadrimaculatus* mosquitoes. At the higher concentration the two formulations performed equally well. At the lower concentration the one containing ENT-20871 caused slightly higher knockdown and kill of females. In tests against *Culex pipiens* the two mixtures caused equal mortalities of females, which were closer to the middle kill range than in the tests against *Anopheles*. These results are given in table 5.

Against Cockroaches.—The tests against the adult female German cockroach were conducted at the same time as the previous work (3). Table 6 indicates that pyrethrins spray containing ENT-20871 was more effective than the one containing piperonyl butoxide, but with allethrin the two synergists were almost equal.

Tests with Aerosols

AGAINST house flies.—ENT-20871 and sulfoxide were compared as synergists for pyrethrins and allethrin in low-pressure aerosols containing insecticide 0.4 percent, synergist 2 percent, deodorized kerosene 6.6 percent, "Velsicol AR-50" 6 percent, and propellants 11 and 12 (1:1) 85 per cent. As shown in table 7, the two pyrethrins aerosols caused similar knockdown and kill of house flies, but the allethrin aerosol containing ENT-20871 was much more effective than the one containing sulfoxide.

The same aerosols were tested after storage at room temperature for one year. Those containing ENT-20871 (G-1162 and G-1163) were compared with identical freshly made formulas. Both the stored aerosols caused greater knockdown and kill than the freshly prepared ones (table 4). With G-1163 this was possibly due to the nearly 16 percent increase in dosage employed with the stored aerosol, but nearly equal dosages of G-1162 were used.

Table 7—Comparison of ENT-20871 and sulfoxide as synergists for pyrethrins and allethrin in low pressure aerosols; tests against house flies. Insecticide 0.4% plus synergist 2.0%. (7 tests)

Aerosol No.	Synergists	Aerosol dosage (grams/1000 cu. ft.)	% Knockdown in— 5 minutes	10 minutes	15 minutes	% Kill in 1 day
Pyrethrins						
G-1162	ENT-20871	3.06	49	80	89	86
G-1159	Sulfoxide	3.15	50	75	87	82
Allethrin						
G-1163	ENT-20871	3.31	53	69	83	76
G-1160	Sulfoxide	3.16	33	59	70	62

Four typical low-pressure aerosols that contained either piperonyl butoxide or sulfoxide as the synergist were compared with similar formulas in which ENT-20871 was the synergist. As shown in table 8, the formulas containing ENT-20871 caused equal kill but greater knockdown than those containing the other synergists.

The medium-pressure aerosol G-1152, which is licensed for use on aircraft, was modified by reducing the pyrethrins content by one-half and adding 2 percent of ENT-20871. This new formula (G-1187) increased knockdown and gave kills equal to G-1152 (table 9).

Against Japanese Beetles.—When the G-1187 and G-1152 aerosols were compared against Japanese beetles, they performed similarly, as shown in table 9.

Conclusion

IT was shown that when 2-(2-ethoxyethoxy) ethyl 3,4-methylenedioxyphenyl acetal of acetaldehyde (ENT-20871) was added to sprays or aerosols containing allethrin, cyclethrin, or pyrethrins, a high degree of synergism was caused. This was demonstrated by the results of numerous experiments against house flies, mosquitoes, cockroaches, and Japanese beetles. In most tests ENT-20871 caused greater knockdown and kill than piperonyl butoxide or sulfoxide. When used alone ENT-20871 caused some mortality but little knockdown.

Experiments with stored aerosols containing ENT-20871 showed no loss of performance, but with stored sprays containing allethrin there was some loss although a lack of material prevented extensive testing.

Literature

1. Beroza, Morton, 1956, 3,4-methylenedioxyphenoxy compounds as synergists

Table 8—Comparison of ENT-20871 and piperonyl butoxide or sulfoxide as synergists for pyrethrins or allethrin in typical low-pressure aerosols; tests against house flies. (6 tests)

Aerosol (figures in percent)	Dosage (grams/1000 cu. ft.)	% Knockdown in — 5 minutes	10 minutes	15 minutes	% Kill in 1 day
G-1059					
Pyrethrum extract (20%) 0.5 DDT 2.0 Lethane 384 Regular 2.0 Piperonyl butoxide 0.5 Velsicol AR-50 5.0 Deodorized kerosene 10.0 Propellants 11 and 12 (1:1) 80.0	3.59	3	54	76	99
G-1188					
Same as G-1059 except ENT-20871 as synergist	3.39	23	71	83	97
G-1073					
Pyrethrum extract (20%) 1.0 Strobane 2.0 Piperonyl butoxide 0.8 Velsicol AR-50 6.0 Deodorized kerosene 5.2 Propellants 11 and 12 (1:1) 85.0	3.84	27	67	80	88
G-1189					
Same as G-1073 except ENT-20871 as synergist	3.61	34	70	84	90
G-1176					
Pyrethrum extract (20%) 1.25 Perthane 2.0 Piperonyl butoxide 0.75 Decdorized kerosene 16.0 Propellants 11 and 12 (1:1) 80.0	3.92	36	64	77	88
G-1191					
Same as G-1176 except ENT-20871 as synergist	3.72	42	73	83	87
G-1178					
Allethrin 0.2 DDT 2.0 Sulfoxide 1.6 Velsicol AR-50 6.0 Deodorized kerosene 10.2 Propellants 11 and 12 (1:1) 80.0	3.86	32	61	71	92
G-1190					
Same as G-1178 except ENT-20871 as synergist	3.70	39	71	82	94

Table 9—Comparative effectivenes of an aircraft-type aerosol with and without ENT-20871 against house flies and Japanese beetles.

Aerosol (figures in percent)	Dosage (grams/1000 cu. ft.)	% Knockdown in— 5 minutes	10 minutes	% Kill in 1 day
House flies (8 tests)				
G-1187				
Pyrethrum extract (20%) 2.5 DDT 3.0 ENT-20871 2.0 Cyclohexanone 5.5 Lubricating oil 2.0 Propellants 11 and 12 (3:7) 85.0	2.78	64	91	96
G-1152 (standard)				
Pyrethrum extract (20%) 5.0 DDT 3.0 Cyclohexanone 5.0 Lubricating oil 2.0 Propellants 11 and 12 (3:7) 85.0	2.64	59	80	94
Japanese beetles (3 tests)				
G-1187	26.10	—	80	85[1]
G-1152	24.40	—	77	82[1]
Untreated checks	——	—	—	0

[1] 2 day count and includes moribund.

for natural and synthetic pyrethrin. *Jour. Agr. Food Chem.* 4 (1): 49-53.

2. Gersdorff, W. A., P. G. Piquett, and Morton Beroza. 1956. Comparative synergistic effect of synthetic 3,4-methylenedioxyphenoxy compounds in pyrethrum and allethrin fly sprays. *Jour. Agr. Food Chem.* 4 (10): 858-862.
3. Fales, J. H., O. F. Bodenstein, and Morton Beroza. 1956. Effectiveness against house flies of some 3,4-methylenedioxyphenoxy compounds as synergists for pyrethrins and allethrin. *Jour. Econ. Ent.* 49 (3): 419-420.
4. Chemical Specialties Manufacturers Association. 1955a. The Peet-Grady Method. Blue Book, *Soap and Chemical Specialties*, pp. 249-50, 267.
5. ..... 1955b. Aerosol test method for flying insects. Blue Book, *Soap and Chemical Specialties*, pp. 253-54, 266-67.
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8. Gersdorff, W. A., and P. G. Piquett. 1955. A comparison of cyclethrin, allethrin, pyrethrins, and mixtures of piperonyl butoxide or sulfoxide with them in house fly sprays. *Jour. Econ. Ent.* 48 (4): 407-409.

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Jefferson Sales Changes

Four changes in the sales department were announced recently by Jefferson Chemical Co., Houston, Tex. A. K. May has been appointed manager of the newly-created sales research and development division, while J. R. Carlson and R. E. Werley have been named managers of the newly-established eastern and western marketing regions, respectively. Ben C. Hayton has been appointed assistant general manager of marketing.

Mr. May joined Jefferson in 1947 and has since served in various technical service and sales capacities. He will be responsible for development of new sales and product diversification. Mr. Carlson, who has been with Jefferson since 1951, was formerly New York district sales manager, while Mr. Werley previously had been Chicago district sales manager. He joined the company in 1948 as a chemical engineer and transferred to sales in 1952. Mr. Hayton joined Jefferson in 1946. He was formerly sales manager of the Houston district.

Insect Attractants and Repellents

By V. G. Dethier*

Department of Biology
Johns Hopkins University
Baltimore 18, Md.

THE subject of insect repellents has recently been reviewed in the *Annual Review of Entomology* (Dethier, 1956b), but there has been no comprehensive review of the field of attractancy since 1947 (Dethier, 1947). During the past 10 years, however, greater effort has been directed toward the former subject than toward the latter. This concentration is understandable because the medical and economic application of repellents is direct and obvious while the relevancy of attractants to control is not immediately evident and their application must be, by the very nature of the agents, indirect. For these reasons most of the work on attractants has been as basically oriented as the work on repellents has been economically oriented. Despite the divergence of motivation, however, there has been such an encouraging advance in our knowledge of the mechanism of action of these agents that it is possible and profitable at this time to assess the degree of progress in their economic development and use, to inquire into what the future may hold for further development, and to ascertain what directions future research should pursue.

Repellents

UNTIL very recently most of the studies of repellents have been conducted in the United States. It is clear that the greatest volume of investigation has been defense oriented, that is, carried out by the Armed Forces, by cooperating government agencies, or by commerical organizations working under contract. By comparison the volume of work undertaken directly by industry for its own use has been smaller. Furthermore, much of the commercial work has been reported only in patent applications; consequently, technical information has not, for the most part, been available in the open literature. It has been difficult to assess this information and to incorporate it into the concrete body of knowledge.

From the outset the goal has changed little. Formulations are desired which are non-toxic, non-irritating, cosmetically acceptable, economically produced, and of long lasting repellency. The original goal has been modified only in that the criterion for the duration of repellency has been increased.

The techniques of repellent screening, of which the major ones are sumarized in Table 1, have gone through a gradual development since first devised by Bunker and Hirchfelder (1925) and Granett (1940). The basic principle has remained unaltered. It consists of testing the ability of candidate compounds or formulations to prevent blood-sucking arthropods from biting a human subject (except, of course, when the candidate is for the protection of cattle). Recently several attempts have been made to substitute laboratory animals for human subjects (Eddy and McGregar, 1949; Wiesmann and Lotmar, 1949; Wasicky *et al.*, 1949; Kasman *et al.*, 1953; and Starnes and Granett, 1953). Regardless of the experimental animal employed nearly every test has been designed to show which compounds possess the best combination of intrinsic repellency, long duration, and ability to withstand skin absorption or wear, laundering, and aging. There have been practically no attempts to separate these factors (see Dethier, 1956b).

The question of intrinsic repellency, that is, how physiologically effective a repellent is on the insect nervous system, is one that can be answered only by an understanding of the mode of action of the different chemoreceptive systems. Since repellency by its very name presupposes an interaction between the insect and the chemical, it is this interaction which must be studied if the problem is to be elucidated. The evidence that many repellents work by way of specialized chemoreceptors is most convincing (Wiesmann and Lotmar, 1949; Dethier and Yost, 1952; Peters, 1956; Dethier, 1956b); therefore any studies which add to our knowledge of the physiology of chemoreceptors inevitably enhance our understanding of repellency.

An understanding of the relation between repellency and chemical structure is a willow-o-the-wisp that has been pursued with more enthusiasm than thought. Current screening methods can certainly indicate whether or not a given chemical configuration is effective on all counts, but beyond that point, since the criterion of repellency employed is a composite one, studies based on data from gross screening tests will not reveal the relation between physiological repellency and structure. The recent report of Wright (1956) indicates that most

* Paper presented during 43rd annual meeting, Chemical Specialties Manufacturers Assn., Washington, D. C., Dec. 5, 1956.

mosquito repellents show a peak in the infra-red absorption spectrum near 460 cm. (21.7u). There are exceptions, however, the most marked being dimethyl phthalate. A great deal of additional investiga-

Table I. Methods of Testing Insect Repellents

Skin Repellents

Investigators in chronological order	Type of test	Dosage and methods of application and testing	Species of insect	Numbers of insects	Biting rate	Criterion of repellency
Granett (1940)	field	1 cc. on arm or 2 cc. on leg, untreated limb exposed 2 min. to determine biting rate, treated limb exposed continuously, untreated limb exposed 2 min. at 15-30 min. intervals.	Aedes sollicitans A. cantator	....	<4-25/min.	time to first bite
Granett and Haynes (1945)	field and laboratory	1 cc. per 100 sq. in. of skin.	Aedes aegypti A. sollicitans A. cantator Anopheles quadrimaculatus A. albimanus A. punctulatus farauti	....	4-30/min.	time to first bite
Pijoan et al. (1946) (from unpub. rpts.) 1944-45	laboratory	1 ml. on arm, paired tests, 15 min. delay between application and test, 5 min. exposures alternately. Subjects allowed to come to equilibrium at testing T for 30 min., otherwise results erratic.	Aedes aegypti	±500	+18/min.	time to first bite, but also time to 2d checked
Travis et al. (1946)	laboratory	1 ml. on arm. 5 min. exposure every 20 min. Paired tests, each arm exposed alternatively.	Aedes aegypti Anopheles quadrimaculatus Stomoxys calcitrans	2000 4000 2000	±80/min. 20-40/min. ±80/min.	time to first bite
	field	1 ml. on arm and 1.5 ml. on leg. Multiple paired tests (i.e., arms and legs). 1 untreated leg exposed 30 sec. at intervals.	S. calcitrans A. taeniorhynchus Eusimulium pecuarum Culicoides spp.	....	40-100/min.	time to 3rd bite
Christophers (1947)	laboratory	Varied dosage on dorsal surface of forearm, solids dissolved in n-butyl alcohol, biting rate determined by exposing untreated arm 15 sec. Treated arm exposed 15 min. at 2, 4, and 6 hrs.	Aedes aegypti	100	10-20/15 sec.	No. and distribution of wheals
McCulloch and Waterhouse (1947)	laboratory tent cage	Approx. 1.5 ml. on face, hands, arms and legs. 0.5-0.8 ml. on hand and arm.	Aedes notoscriptus A. alboannulatus A. aegypti	1000-2000 100	>25/min. >25/min.	time to rate of one bite/min. for weak repellents time to 5th or 6th for strong
	field	3 ml. per leg, 1 ml. per hand and arm, 1 ml. on head. Untreated limb exposed at 15 min. intervals.	A. vigilax A. similis Anopheles punctulatus farauti		25-50	
Travis (1949)	field	25% solutions in ethyl alcohol.	Aedes flavescens A. communis A. excrucians A. pionips	....	....	....
Travis et al. (1949)	laboratory	1 ml. on forearm, exposed 3 min. at 20-30 min. intervals. Unpaired tests and paired tests with dimethyl phthalate, arms exposed alternately.	Aedes aegypti Anopheles quadrimaculatus	several thousand	100-150/min. (A. aegypti) 40-50/min. (A. quad.)	time to first bite repellent ratio = $\frac{\text{test time}}{\text{DMP time}} \times 100$
Applewhite and Smith (1950)	field	1 ml. in 25% soln. of 95% alcohol on forearm, different comp'd on each arm. 9 subjects, each comp'd tested once on each S and paired with each other.	Aedes flavescens A. excrucians A. communis A. pionips	....	15-30/min.	time to first confirmed bite (i.e., confirmed by a 2d bite within 30 min.)
Travis (1950)	laboratory	¼ teaspoonful to arm and ⅜ to leg. Arm exposed at 20-30 min. intervals.	Aedes aegypti Anopheles quadrimaculatus	....	100-150/min. (A. aegypti) 10-40/min. (A. quad.)	time to first bite
	field	Arms and legs exposed as above.	Aedes taeniorhynchus A. sollicitans Stomoxys calcitrans	....	20-100+/min. 76-188/min.	time to first bite

Table I. Methods of Testing Insect Repellents (Continued).

Investigators in chronological order	Type of test	Dosage and methods of application and testing	Species of insect	Numbers of insects	Biting rate	Criterion of repellency
Applewhite and Cross (1951)	field	1 cc. 25% soln. of 95% alcohol on arm. 1.5 cc. 25% soln. of 95% alcohol on leg. Each comp'd tested twice on 6 S and paired once against each other.	Aedes flavescens A. excrucians A. communis A. pionips	....	20-145/min.	time to first confirmed bite
Travis (1951)	laboratory	Arm exposed at 20-30 min. intervals.	Anopheles quadrimaculatus A. freeborni A. punctipennis	....	10-40/min.	time to first bite
Smith and Cole (1952)	laboratory	1 cc. on forearm and standard on other. Each arm exposed 3 min. every 30 min.	Aedes aegypti Anopheles quadrimaculatus	....	....	time to first confirmed bite (sometimes av. time to 6th)
	field	Same as above, both arms exposed simultaneously.	Aedes sollicitans A. taeniorhynchus	....	....	time to first confirmed bite (sometimes av. time to 6th)
Kasman et al. (1953)	laboratory	0.05 ml. on 35 sq. cm. skin area of guinea pig. 3 min. exposure at 27 min. intervals.	Aedes aegypti	1000	landing rate 15-35/min.	$T = (30"+30/b)$ where $n =$ no. of 3 min. exposures before a single exposure or successive exposures with min. 3 bites; $b =$ no. bites in first exposure which contributes to total of 3 bites
Geigy and Utzinger (1953)	laboratory	Comp'd on forearm, glove on hand, 20 min. exposure. Impregnated filter paper at one end of cylindrical ant cage, 100 3-min. visits counted.	Aedes aegypti Formica rufa	100 10-15	variable	ratio of no. probing and feeding to total no., visits on glove and arm. ratio of no. of visits to treated and untreated ends of cage.
Roadhouse (1953)	laboratory	1 gm. on forearm. 3 min. exposure at 30 min. intervals. Untreated arm exposed at beginning and end of test and at 3 hr. period.	Aedes aegypti	1000	+40/min.	av. of time to 1st, 2d and 3d bites and av. of landing rates in each 3 min. period
Altman and Smith (1955)	field	1 ml. diluted in ethanol on arms, tested in block test with a standard and in round-robin tests.	Aedes communis A. punctor A. excrucians A. fitchii A. stimulans Culiseta impatiens C. alaskaensis	....	....	$\text{av. } T = \frac{2T' - B}{\frac{n}{r}} + M$ where $M =$ grand mean of all times $T' =$ time for all tests with compound i $B' =$ time for both in all pairs $n =$ no. repellents $r =$ no. of times each pair is replicated.

Clothing Repellents

Investigators in chronological order	Type of test	Dosage and methods of application and testing	Species of insect	Numbers of insects	Biting rate	Criterion of repellency
Granett and Haynes (1945)	laboratory	Cotton bunting arm sleeve, dipped, wrung, dried till containing approx. 4 gms./sq. ft. exposed for 2 min.	Aedes aegypti	±3000	....	time to 1 bite (usually more) in 2 min.
Christophers (1947)	laboratory	Fabric on arm, 30 sq. in., dosage varied, exposed 15 min.	Aedes aegypti	200	....	no. and distribution of wheals
Linduska and Morton (1947)	laboratory	2 gms. of comp'd as a 10% acetone (or other) soln. on mercerized cotton hose on arm = to 0.6 sq. ft. at rate of 3.3g/sq. ft. exposed alternately in cage of each species for 2 min. daily.	Aedes aegypti Anopheles quadrimaculatus	several thousand	100-150/min. (A. aegypti) 50/min. (A. quad.)	days to first bite (= complete protection) days to fifth bite (= partial protection)

Table I. Methods of Testing Insect Repellents (Continued).

Investigators in chronological order	Type of test	Dosage and methods of application and testing	Species of insect	Numbers of insects	Biting rate	Criterion of repellency
Smith and Burnett (1948)	laboratory	3 gm./sq. ft. acetone soln. on cotton hose..	Aedes aegypti	....	....	time to 5 bites per min.
	field	3 gm./sq. ft. acetone soln. on cotton hose worn in succession by 5 S for 5 min. exposure at weekly intervals, effective comp'ds tested at rate of 0.75 g/sq. ft. Extended wear tests, 0.75 g/sq. ft., tested at 6 hr. intervals.	A. taeniorhynchus A. sollicitans	....	12-100/min.	time to 5 bites per min.
Applewhite and Smith (1950)	field	3 g/sq. ft. cotton stocking, dissolved in 50 ml. acetone, exposed 10 min. on arms and legs, tested on 3 S. Ageing, wearing and washing tests.	Aedes flavescens A. excrucians A. communis A. pionips	....	....	....
DeFoliart (1951)	field	1 cc. to arm; 1.5 cc. to leg. Continuous exposure to 5th bite.	Prosimulium hirtipes Simulium venustum S. perissum	....	1-15/min.	time to 1st, 3d and 5th bite
Smith and Cole (1951)	field	1500 cc./37 sq. ft., emulsions at desired dosage on T-shirts and herringbone twill worn 8 hrs. between tests, tested on 2d, 4th, 6th and 8th day after treatment, exposed 10 min. in each of 3 locations.	Aedes sollicitans A. taeniorhynchus	....	71-364/30 min.	difference in no. bites on treated and untreated
	field	2-3 g/sq. ft., acetone solns. on stockings worn for 8 hr. periods, 5 min. exposure on each of 3 S.	Aedes sollicitans A. taeniorhynchus	....	71-364/30 min.	av. no. bites less than 5 in 5 min.
	laboratory	Stockings impregnated with acetone soln. or emulsion at varied dosage.	Aedes aegypti Anopheles quadrimaculatus	....	....	<5 bites/min.
Travis et al. (1951)	field	¼ teaspoon to arm; ⅜ to legs.	Eusimulium pecuarum	....	....	time to first bite
			Prosimulium hirtipes	....	60/10 min.	difference in no. on treated and untreated legs
			Simulium venustum	....		
Travis and Smith (1951)	laboratory	¼ teaspoon to arms, ⅜ to legs. 3 min. exposures at 15 min. intervals.	Stomoxys calcitrans	approx. 2000	20-40/min.	time to 1st bite
Smith and Gilbert (1953)	laboratory	Cotton stockings, 3.3-3.6g/sq. ft., 1 min. exposure of each stocking on each S, tested after ageing on A. aegypti; after wearing, on A. quad. and A. taeniorhynchus.	Aedes aegypti A. taeniorhynchus Anopheles quadrimaculatus	1000-2000	....	10 or more bites/min. for A. quad. more than 10 bites/2 min.; for A. aegypti no. of bites, also 10 or more bites/min.
	field	Exposed 5 min. on leg of each of 3 S.	A. taeniorhynchus	....	25/min.	time to av. 5 bites on 3 S, time to 1st and 5th bite, time to bites on 2 S, time to total 15 or more bites for 3 five min. periods
Starnes and Granett (1953)	laboratory	5% acetone solns. on cheese cloth adjacent to rabbit.	Stomoxys calcitrans Musca domestica	15-20 per expt.	....	time for 5% to feed

Ticks and Fleas

Investigators in chronological order	Type of test	Dosage and methods of application and testing	Species of insect	Numbers of insects	Biting rate	Criterion of repellency
Linduska et al. (1946)	laboratory	Acetone solns. impregnated in cotton twill strips at rate of 8g/sq. ft. Strips waved in tub of fleas then held above tub for 30 sec. No. remaining then counted. Subjects wearing hose stood in tub 4 min. Subjects wearing clothing stood in tub 15 min.	Ctenocephalides canis C. felis	several thousand	....	R = % reduction in no. on treated below no. on untreated

Table I. Methods of Testing Insect Repellents (Continued).

Investigators in chronological order	Type of test	Dosage and methods of application and testing	Species of insect	Numbers of insects	Biting rate	Criterion of repellency
Smith and Gouck (1946)	field	Clothing sprayed, dosage varied, worn during day.	Amblyomma americanum Ixodes ricinus scapularis	....	....	No. attached per 24 hrs.
Brennan (1947)	laboratory	Socks impregnated at rate of 2 ml. or 2g./sk. ft., 15 min. exposures.	Amblyomma americanum Dermacentor andersoni	several thousand	....	ratio of no. on treated and untreated socks
Granett and Sacktor (1947)	laboratory	Applied to surface of filter paper in circular band. 5 ticks placed in center and no. crossing in 5 min. observed.	Amblyomma americanum	5 per test	....	% repellency = $\frac{\text{check crossings} - \text{treatment crossings}}{\text{check crossings}} \times 100$
Brennan (1948)	field	Treated clothing, 4 hr. exposure per day, 2 oz. repellent in acetone per uniform. Ticks removed and counted hourly.	Amblyomma americanum	....	....	% repellency = $\frac{\text{no. on check} - \text{no. on test}}{\text{no. on check}} \times 100$
Smith and Burnett (1948)	laboratory	Clothing and patches treated with acetone soln. containing 2gms. comp'd/sq. ft. Treated and untreated patches swung over pen of fleas and nos. counted. Stockings worn by subjects in flea pen. 15 min. exposure. Paddle blade with untreated strip on bottom and treated on top held in grass and nos. crossing per min. counted. Check paddles used to get no. on check.	Amblyomma americanum Ctenocephalides felis Xenopsylla cheopis	....	....	% repellency = R = $\frac{\text{no. on check} - \text{no. on test}}{\text{no. on check}} \times 100$
Cole and Smith (1949)	field	Uniforms impregnated at rate of 2g/sq. ft., emulsions and acetone solns. Exposure 1-7 hrs.	Amblyomma americanum	....	count of 15 attached or total of 25	% repellency = $100 \times \frac{N \cdot T}{N}$
Smith et al. (1949)	field	Uniforms impregnated at rate of 2g/sq. ft., emulsions and acetone, 4 hr. exposure.	Amblyomma americanum	....	total count 25	% repellency = $100 \times \frac{N \cdot T}{N}$
Granett and French (1950)	field	Trouser leg impregnated at rate of 2-4g/sq. ft. Other leg untreated. Impregnated drag cloths also used. Coveralls impregnated and exposed 4 hrs., hourly counts.	Dermacentor variabilis	....	several hundred in 5-10 min.	% reduction over check
Smith and King (1950)	field	Liquids impregnated at rate of 2g/sq. ft.	Amblyomma americanum	....	total count of 25	R = $100 \times \frac{N \cdot T}{N}$
Granett and French (1951)	field	Coveralls impregnated 2g/sq. ft. Dogs treated at rate of 2g/Kg. body wt.	Dermacentor variabilis	50-100 per 100 yds.	....	ratio on check and test
Smith et al. (1954)	field	Uniforms impregnated at rate of 2g/sq. ft. for comp'ds and 1.5-3.6 g/sq. ft. for mixtures. Exposure period 1-2 hrs.	Amblyomma americanum	....	....	R from counts of ticks on test and check

tion will have to be carried out before the basis of repellency is established on a firm footing.

It is not surprising, therefore, that there have been no repellents developed which can truly be said to be "more repellent" in terms of their reaction with the insect; however, some have been developed which retain their effectiveness for longer periods of time. A major development in the direction of prolonging the duration of repellency has been the perfection of clothing repellents, those compounds which are impregnated on wearing apparel. Here the concern is with the ability to withstand aging, wear, and laundering. The greater duration of repellency of clothing repellents as compared with skin repellents, days as opposed to minutes, indicates most strongly that the greatest enemy of lasting repellency is the human skin itself. The integument as a living tissue does not remain inert and neutral in its relation to repellents. It is clear that investigations into the reaction between skin and repellents are a most necessary prerequisite to the development of longer lasting skin repellents.

The question as to whether or not there is a continued need

(*Turn to Page* 117)

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Automotive Antifreezes

By J. J. Ondrejcin*

Polychemicals Department
E. I. du Pont de Nemours & Co.
Wilmington, Del.

THE Chemical Specialties Manufacturers Association, in a survey conducted in 1955, reported that about 110 million gallons of antifreeze were sold to protect the cooling systems in 60 million passenger cars, trucks, and buses. About 70 per cent of the antifreeze was based on ethylene glycol and 30 per cent on methanol. The retail value of the antifreeze sold was estimated at 280 million dollars.

We do not intend to discuss the financial aspects of antifreeze business except to point out it is one of the important industries associated with the automotive marketing field. Rather, our discussion will be confined to the technical side pointing out why certain chemicals have been selected as antifreeze bases, some of the problems of formulation and the reasons for some of the modern automotive cooling system practices and recommendations. Much of the information to be discussed is based on the experience and research of the Du Pont Company, some from the literature published by the National Bureau of Standards and the Society of Automotive Engineers, and some from the work done by technical societies like the American Society for Testing Materials Committee D-15 on engine antifreezes.

Need for Antifreeze

THE need for automotive antifreezes dates back practically to the invention of first motor cars powered by the internal combustion engine. This engine, as we know it today, develops a great deal of heat in its operation. In fact, automotive engineers tell us that a passenger car engine develops enough heat to keep a six room house warm when the temperature outside is 0°F. Approximately two-thirds of the heat generated goes to power or is carried out by means of exhaust gases; however, one-third of the heat produced must be carried away by a coolant to prevent overheating and ultimate destruction of the engine. As you all know, water is the universal coolant for automobile engines, but since most of our American citizens require the use of their cars in the wintertime, and in most areas of the United States temperatures below the freezing point of water are experienced, an antifreeze is required.

Table I gives some of the most important properties an antifreeze solution should possess.

By definition, an antifreeze is a substance which when added to the coolant will prevent freezing of the coolant at temperatures to which the equipment is subjected. This, of course, is the first requirement for any antifreeze. Ideally, we would want to add as little of our antifreeze as possible, that is have a very efficient antifreeze.

The antifreeze compound should be chemically stable under conditions encountered in cooling system operation because decomposition could reduce the antifreeze function as well as result in corrosive by-products.

Table 1. Desirable Properties of Antifreeze Solutions

- Low freezing point
- Chemical stability
- Non-corrosive
- Low viscosity
- Good heat transfer properties
- Reasonable cost and availability

We expect protection against corrosion of any of the metals in the cooling system as well as a minimum effect on the rubber hose connections. Corrosion inhibitors are very important here and we shall discuss these later on.

A low viscosity fluid is necessary so that it can be pumped through the cooling system with a minimum expenditure of energy. Heat transfer properties like specific heat and thermal conductivity should be as high as possible to remove heat efficiently from the interior metal surfaces of the head and block and carry the heat to the radiator where it can be exhausted to the atmosphere.

The last point in Table I, while obvious, should not be neglected. A material which is too expensive and/or unavailable cannot be considered for automotive use.

Besides the desirable properties of antifreeze solutions which are listed in Table I, other requirements are sometimes mentioned. For example, the solution should have a high boiling point, have a low coefficient of expansion to reduce possible overflow losses, and resist foaming. It should be non-toxic, non-flammable, and should not produce an unpleasant odor.

When one considers all of the requirements demanded of an antifreeze formulation it is not surprising that only a few of the industrial chemicals are suitable for this use.

Over the years, two types of antifreeze formulations have

* Paper presented during 43rd annual meeting, Chemical Specialties Manufacturers Assn., Washington, D. C., Dec. 4, 1956.

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Table 2. Advantages of Methanol Based Antifreeze

- Efficient freezing point lowering
- Economy
- Chemical stability
- No crankcase damage

withstood the test of time and account for the majority of antifreeze sold today. These are based on methyl (wood) alcohol or on ethylene glycol. Some antifreezes contain ethyl or grain alcohol and isopropyl alcohol but these are not a very large percentage of the total volume.

Figure 1 will give you an idea of the relationship between freezing point on concentration of the common antifreeze bases. Note that gallon for gallon methanol produces the greatest lowering of freezing point, followed by ethylene glycol and then denatured alcohol. The relationship is roughly three quarts of methanol to 3¾ quarts of ethylene glycol. Thus, considering initial cost and antifreeze efficiency, methanol based products give the greatest freezing point lowering per dollar spent for antifreeze. However, depending upon conditions of cooling system operation, the use of methanol based antifreeze may not always be desirable.

At this point it seems appropriate to enumerate the advantages of the two types of antifreeze previously mentioned. Table 3 gives the "plus" points of the

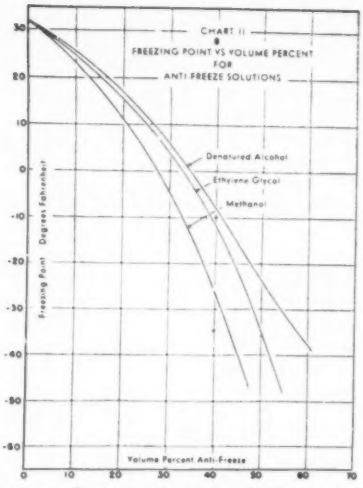

Figure 1. Freezing point vs. volume per cent of anti-freeze.

methanol based antifreeze.

Methanol Advantages

As previously mentioned, the most efficient way to lower the freezing point of a solution is to use methanol based antifreeze. In addition, the price of a gallon of methanol based antifreeze is about 50 per cent that of a gallon of ethylene glycol material. The chemical stability of methanol is very good and under the conditions of normal cooling system operation methanol cannot decompose. The last advantage deals with the accidental leakage of a methanol antifreeze solution into the crankcase, due to a ruptured or ill fitting head gasket. The methanol in the crankcase will in all probability be volatilized and the

Table 3. Advantages of Glycol Based Antifreeze

- High boiling point
- Non-flammability
- No finish damage

damage will be no more than would occur if the coolant were water alone.

It is not correct to imply the use of methanol does not present problems in certain cases. Here are some of the points which are sometimes brought out.

The addition of methanol antifreeze to water results in solutions which have boiling points lower than water alone. At high altitudes where boiling points are lower or at a high degree of protection there is more chance of boil over loss with methanol than with ethylene glycol solutions. Of course, the boiling point is increased by the use of pressure caps so that in some cases compensation of the lowered boiling point is realized.

Another factor often pointed out is the possibility of damage to the car finishes if concentrated alcohol antifreeze is accidentally spilled. If the antifreeze is diluted with water before addition to the cooling system, the possibility of damage to car finishes can be avoided.

All alcohol solutions, except very dilute ones, can be ignited at temperatures encountered in automotive systems. However, tests conducted by the National Bureau

Figure 2. Corroded water pump.

Figure 3. New water pump.

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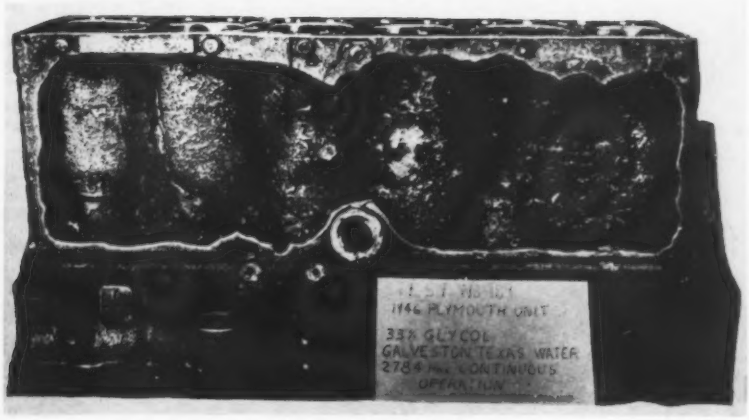


Figure 4. Rusty block.

of Standards demonstrated that a spark or flame was necessary to ignite these solutions. Heat from the exhaust gas was not sufficient. So much for methanol based antifreeze. Table 3 gives some of the advantages of ethylene glycol based antifreeze.

Ethylene Glycol Pros

UNLIKE methanol solutions, aqueous solutions of ethylene glycol have higher boiling points than water alone and make possible a higher temperature level of operation. The possibility of boil over losses is reduced and more heat can be obtained from car heaters.

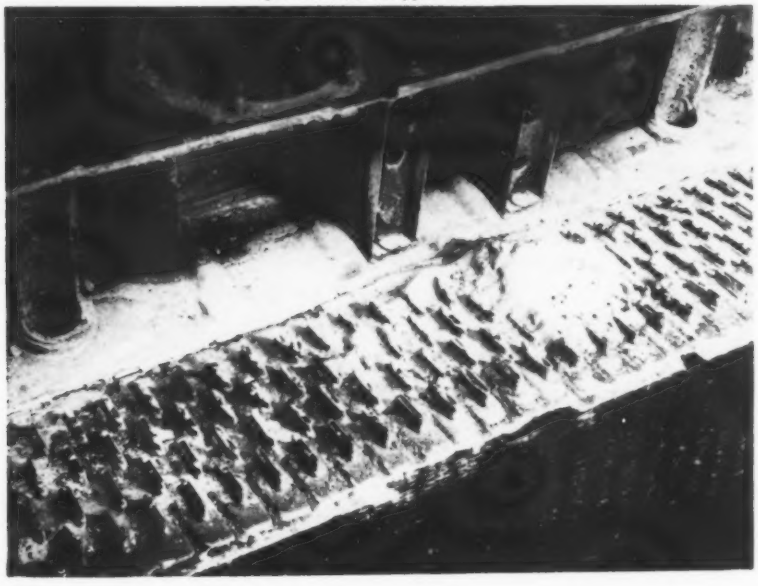
The non-flammability aspect of glycol antifreezes is obvious. Concentrated ethylene glycol will burn at very high temperatures; when diluted with as little as 15 per cent water solutions are not flammable.

Finally we have the advantage that the accidental spilling of glycol antifreeze will not harm car finishes.

Like every other product, there are some problems associated with the use of glycol based antifreezes.

For example, it can be stated that glycol does not belong in the crankcase of an automobile. However, that does not alter the fact that occasionally because of a warped head, improperly tightened head bolts, or a defective head gasket some glycol antifreeze does get into the engine lubricating oil. If the leakage is serious and the defect not remedied, varnishes from the glycol can form and eventually the engine will "freeze" necessitating costly dismantlement and cleaning.

Figure 5. Rust clogged radiator.



Corrosion Inhibitors

AT this point it seems logical to say a word on the subject of rust and corrosion inhibitors. Of course, corrosion inhibition is necessary in the case of methanol based antifreezes, too, but the inhibition of glycol antifreeze is a much more difficult problem.

Glycols tend to oxidize to corrosive acids under conditions encountered in cooling system operation. This oxidation is promoted by certain mechanical defects such as air suction at the water pump shaft seal or lower hose connection, and exhaust gas leakage. Reputable glycol antifreezes contain inhibitors which impart reserve alkalinity to the solution so that the harmful acids are neutralized as rapidly as they are formed preventing damage. However, in time this reserve alkalinity will be used up and the coolant will turn acid causing rapid corrosion of cooling system parts. Figure 2 shows a water pump impeller which has been badly corroded by an acid glycol solution. The impeller blades have been almost completely eaten away. Figure 3 shows a new water pump for comparison.

Another problem which can arise if acid glycol solutions are used is rusting of the block. When iron rusts, we are not primarily concerned with the fact that holes will be eaten in the engine block, head, etc., although this can and has happened. The chief difficulty with rust is that it flakes off the surface and plugs the thin water passages in the radiator, reducing or stopping coolant flow. Overheating will result. Figure 4 shows what rust can do to the coolant passages in the block. Figure 5 shows what can happen to the radiator in a rusty cooling system.

The thinner metal parts, like copper radiator tubes, can be

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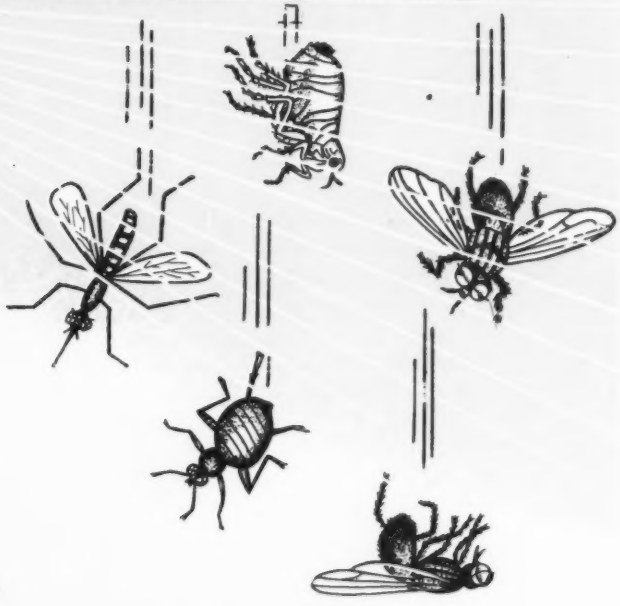

GEIGY METHOXYCHLOR "90"

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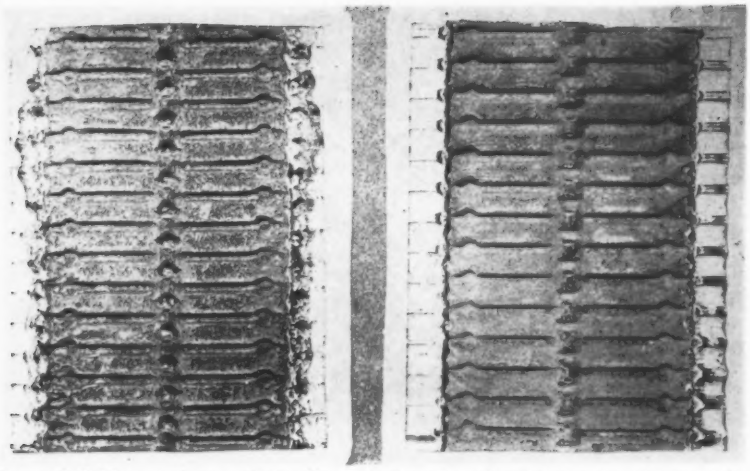


Figure 6. Solder attack on radiator. Unattacked section of radiator water tube on right.

corroded through. Solder attack may weaken radiator joints so that they are easily opened up by mechanical vibration. This is illustrated in Figure 6 which shows a section of a radiator water tube which has been split apart to show solder attack. An unattacked section is shown for comparison.

From the past few illustrations you can understand why the manufacturer of antifreeze wants to be certain corrosion problems will not confront the consumer. Because it is difficult to determine the condition of the inhibitor in the antifreeze without laboratory tests, competent authorities advise antifreeze be discarded after one season's use. This is difficult advice to take because I'm sure everyone has a brother-in-law, uncle, or friend who prides themselves on having used a glycol antifreeze solution more than one season without incident. I'm sure you are not apt to hear about those cases where trouble occurred. In any case, it is foolish to risk the cost of high repair bills when a new change of antifreeze costs so little.

Since inhibitors are very important we might touch quickly on the evaluation of rust inhibitors.

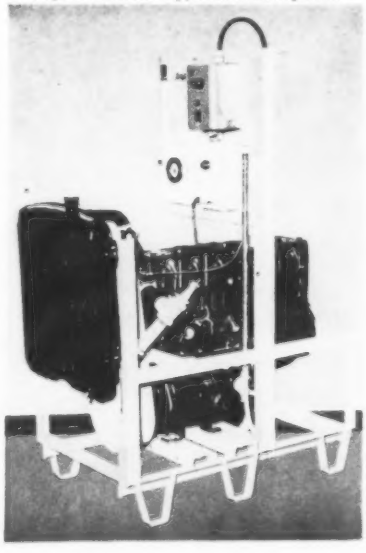
Rust Inhibitors

OUR evaluation of inhibitors involves three separate steps. The first is the laboratory screening test in which strips of metal are suspended in the solution for a period of time and then weighed and examined for evidence of corrosion. This test is useful only in selecting inhibitors worthy of further study. The next step is the simulated service test in which the inhibitor is tested in bench-type circulating units which approximate conditions of actual use. One of these units is shown in Figure 7. The final testing utilizes carefully controlled car tests.

Types of Inhibitors

TWO types of inhibitors are commonly used in antifreezes to prevent rusting and corrosion. One is known as an oil or mechanical inhibitor and the other as a chemical inhibitor. The oil type prevents corrosion by physically coating the metal surfaces with a thin film of oil. The oil inhibitor may or may not be soluble in the concentrated antifreeze, but always separates when water is added, forming a layer which floats on top. The chemical type prevents corrosion by reacting with the metal surface to make it more resistant to attack. Chemical inhibitors are completely soluble in both the concentrated and diluted antifreeze.

Figure 7. Bench type circulating unit.



In most cases, antifreezes don't have just any inhibitor in them. The inhibitors contained in our products, "Zerone"* and "Zerex"* are of the chemical type and were developed after years of study of cooling system corrosion and ways of overcoming it. These studies are continuing in an effort to improve our products further in this respect.

The use of a good antifreeze alone will not solve all cooling system problems. It is necessary to exercise proper maintenance precautions – to keep the cooling system free from corrosion products by use of a water inhibitor in the summer months and to replace or repair damaged parts of the cooling system. Under these conditions, most cooling systems will operate so efficiently that we are unaware of their existence.

—★—

New Temperature Stabilizer

A new temperature stabilizer, designed to maintain uniform temperature at a range from 40 to 120 degrees fahrenheit, has been developed by Jet-Heet, Inc., Englewood, N. J., it was announced recently by Calvin D. MacCracken, president. Tradenamed "Transit-Heat," the product comes in a sealed quart can. One quart of stabilizer is claimed to maintain even temperature in an 800 cubic inch volume of insulated package. Further information can be obtained on request to the company, 152 South Van Brunt Street, Englewood, N. J.

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Chlorothene in Aerosols

An inhibited grade of methyl chloroform which may be used as a replacement for carbon tet in general cold cleaning also shows promise for aerosol applications.

By J. W. Barber*
Dow Chemical Co.
Midland, Mich.

THE properties of a new halocarbon indicate it may find application in pressure packaged products. The halocarbon is available under the trademark "Chlorothene,"† which is a registered trade name for an inhibited grade of methyl chloroform or 1,1,1,-trichloroethane. When methyl cloroform first became available in commercial quantities several years ago, it was found that it had very desirable properties with respect to low toxicity, good evaporation rate, and a not unpleasant odor. Its flammability characteristics are in the general range of other widely used chlorinated solvents such as trichloroethylene. These attributes quickly lead to the realization that this was a material that could be used as a replacement for carbon tetrachloride in general cold cleaning applications without the toxic hazard of carbon tetrachloride. This cold cleaning application was the first volume market for "Chlorothene." Aerosols may be the second. The more important physical properties of the material are shown in Table I.

"Chlorothene" exhibits a narrow boiling range from about 160° to 190°F. The specific gravity is moderate and almost identical to that for methylene chloride. "Chlorothene" does not exhibit any flash or fire point by the open or closed cup tests. It has a very low viscosity at room temperature and a moderately high vapor pressure so that the evaporation rate is comparable to that of carbon tetrachloride. The color is almost water white.

Table I. Physical Properties of Chlorothene

Boiling Range 760 mm. Hg. (Initial to Dry Point)	162° to 191°F.
Specific Gravity 25/25°C.	1.312-1.321
Lbs. per gallon	11
Flash Point	None
Fire Point	None
Viscosity 25°C., centipoises	0.79
Vapor pressure at 70°F., mm. Hg.	110
Color APHA (Pt-Co scale) Maximum	15

Low Toxicity

IT is generally accepted that "Chlorothene" is one of the least toxic of the non-flammable solvents, its maximum allowable concentration being 500 parts per million in air. This means that a person may tolerate a concentration of up to 500 parts per million, eight hours per day, five days a week, for a working lifetime without adverse physiological effects. For this reason, it is highly regarded as a replacement for carbon tetrachloride and is recommended by many health authorities in cold cleaning operations where toxicity is an important factor. Thus, "Chlorothene" may be considered for use in aerosols where a non-flammable solvent of low toxicity is applicable or necessary.

The solubilities of a group of materials in "Chlorothene" are reported in Table II.

This tabulation in Table II shows that "Chlorothene" exhibits good solvency for various materials. This property has proven to be particularly useful in the preparation of aerosol concentrates.

Table II. Solubility of Various Materials in Chlorothene at 70°F.

Material	Gms. dissolved per 100 grams of Chlorothene
DDT	41
Methoxychlor	67
Chlordane	350
Lindane	17.5
Pentachlorophenol	5.5
S-Naphthol	1.5
Ethylene glycol ethyl ether	100
o-Dichlorobenzene	100
p-Dichlorobenzene	72
Stoddard solvent	100
Xylol	100
Mineral hydrocarbon	100
Isopropyl alcohol 99%	100
Perfume and essential oils	100
Ethylene glycol	1.0
Propylene glycol	1.0
Triethylene glycol	6.5

Vapor Pressure Depressant

CHLOROTHENE is an excellent vapor pressure depressant for propellent 12. In this respect we have developed curves at 70° and 130°F., (Figs. 1 and 2). These data were determined by evacuating a closed vessel and filling this container with each of the three components, "Chlorothene," propellent 12 and propellent 11, in various combinations. The sealed vessel was then placed in a con-

(*Turn to Page* 103)

* Chlorothene is a registered trademark of Dow Chemical Co., Midland, Mich.

* Paper presented during 43rd annual meeting, † Chlorothene is a registered trademark of Dow ington, D. C., Dec. 5, 1956.

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COVER ODOR N-4 (I) (PE)
COVER ODOR P. No. 1954 (S)
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COVER ODOR R.C. No. 604 (PE)
COVER ODOR SASS. No. 1954 (A)
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Oil Jasmin No. 613
Oil Mimosa No. 615
Oil Wild Rose No. 55
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Oil Mint No. 523
Oil Narcissus No. 614
Oil Vermont Pine No. 55
Imitation Geranium No. 24

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Oil Bouquet Almond No. 8262
Oil Clover No. 888
Oil Corylopsis No. 55
Oil Bouquet H.O. No. 8267
Oil Bouquet M. No. 55
Oil Bouquet Narcissus No. 55
Oil Bouquet Wild Rose No. 55
Oil Bouquet TV No. 55

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Oil Lilac No. 4315
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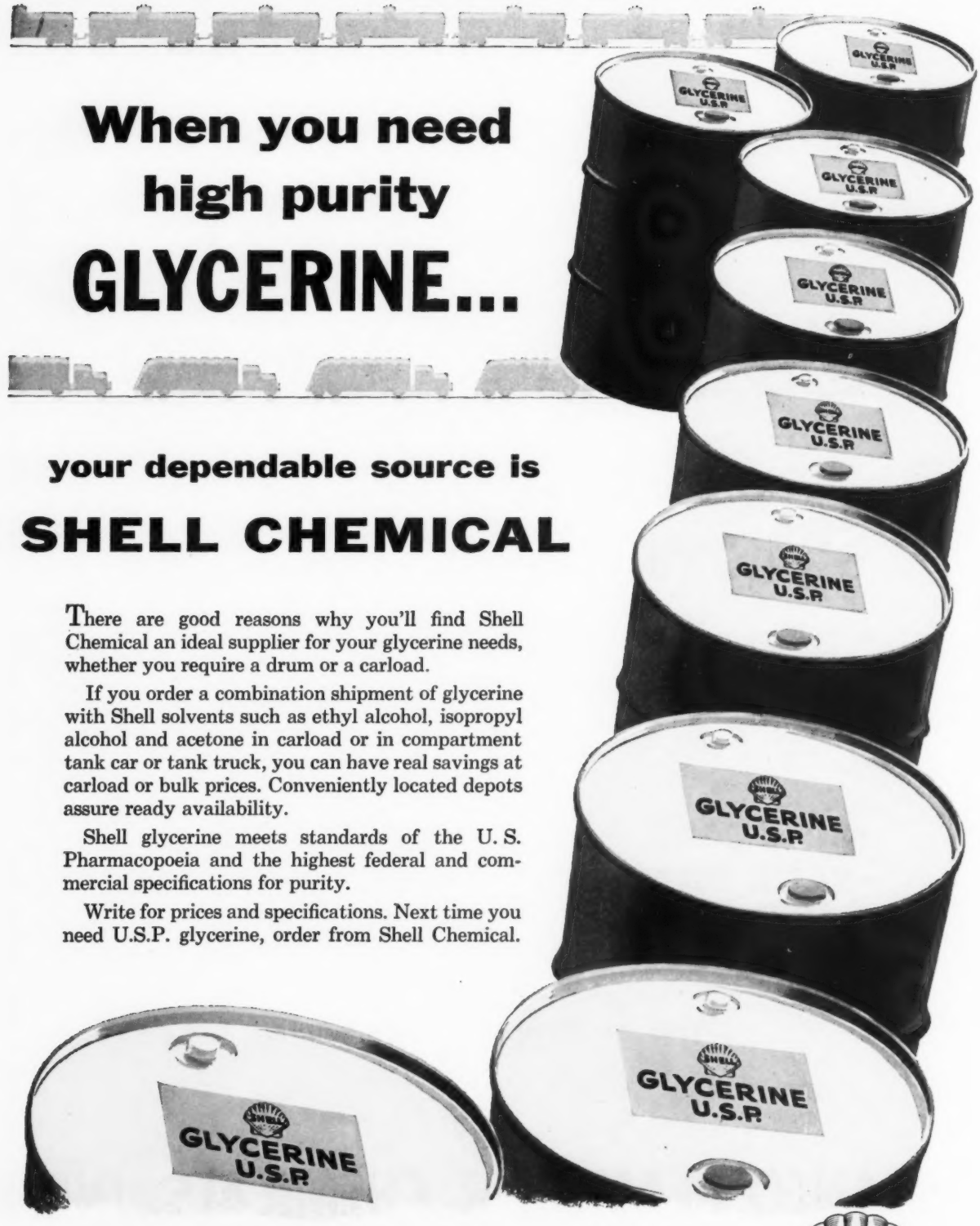

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stant-temperature bath and the pressure in the vessel determined.

We believe that these data are accurate to within ± one pound per square inch gauge. These curves show in the various pressures developed by mixtures of "Chlorothene" with propellent 12 and with "Chlorothene" and various combinations of propellents 11 and 12. There is a quick method of determining what combination of propellents 11 and 12 will be required with a given amount of "Chlorothene" to produce a desired pressure.

To illustrate this point, let us say that you would like to load a given formulation with 20 percent "Chlorothene" to yield a 35 pound per square inch propellent composition. A straight line should be drawn from the 100 percent "Chlorothene" point "B" through the point at which the 35 pound isobar crosses 20 percent "Chlorothene" in the composition. This straight line when extended to meet line "AC" will fall on the composition of propellents 11 and 12 required to produce the desired pressure. In this case the final propellent composition would contain 20 percent by weight "Chlorothene" and 80 percent of a mixture consisting of 67 percent propellent 12 and 33 percent propellent 11. It is very interesting to note that a 54:46 mixture of "Chlorothene" with propellent 12 will produce 34 pounds per square inch gauge at 70°F., while at 130°F. this same composition will produce approximately 90 pounds per square inch. This is in contrast to a 50:50 propellents 11 and 12 composition which produces 34 pounds per square inch at 70°F. but 102 pounds per square inch at 130°F.

Table III. Corrosion of Metals by Chlorothene at 70°F.

Metal	Mils penetration per year 0.01% H_2O	50:50 water to Chlorothene
Aluminum 24S	0.07	35
Copper	0.06	0.53
Brass 85:15	0.01	0.16
Iron (SEA 1010)	0.20	8.0
Monel	0.02	0.04
Stainless steel 304	0.008	0.01
Tin	0.008	0.17
Zinc	0.03	32

Effect on Valves

AEROSOL formulators and loaders are very interested in the effect "Chlorothene" may have on valve losses and valve parts, its corrosive effect on aerosol cans, and how it reacts to moisture. Let us first consider valve function and losses with formulations containing "Chlorothene." We have been evaluating "Chlorothene" in aerosol formulations for several years and have never encountered a standard cap mounted valve which failed to function due to the presence of "Chlorothene" in the formulation.

In recent tests with insecticide formulations containing approximately 25 percent "Chlorothene" with the eyelet type valve of brass-nylon construction losses have ranged between 0.6 grams per year with the Buna-N gasket and two grams per year with the Neoprene gasket. Although we have tested and will continue to test formulations for valve function and leakage we suggest that the valve manufacturer also be consulted in this matter.

Metal Corrosion

TABLE III shows metals which have been exposed to "Chlorothene" mixed in a 50:50 ratio with water. These corrosion tests were made at 70°F. to reflect the temperature normally encountered under most conditions of long storage.

Examine first the corrosion rates indicated as mils penetration per year produced by "Chlorothene" containing 0.01 percent water. It is evident that none of the metals was seriously corroded by "Chlorothene" under these conditions. Iron having the designation of SAE 1010 was corroded very slightly to give a rate of penetration on the order of 2-10,000 of an inch per year. Most of the metals were only stained under these conditions.

In the second column of Table III are the corrosion results of the exposure of these metals to a 50:50 mixture of water and "Chlorothene." These metals were all exposed on the basis that one-third was in the "Chlorothene" layer, one-third in the water layer and one-third in the air above the water. Two metals were very definitely attacked: aluminum 24S and zinc. This means that aluminum and zinc should not be used where

Figure 1

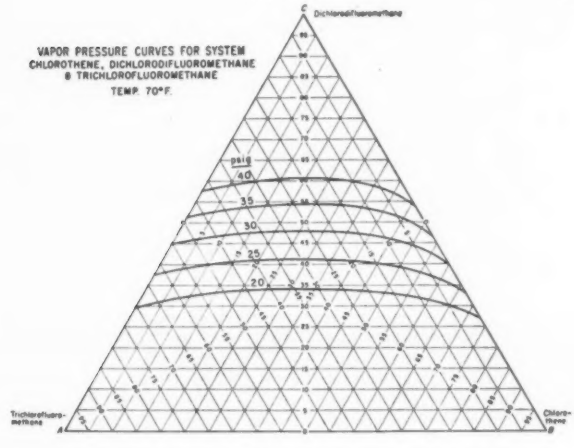
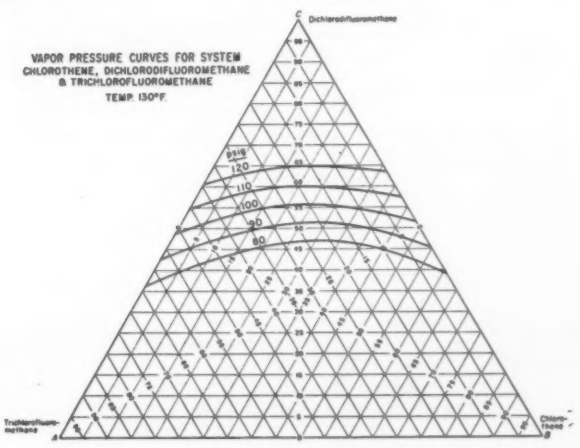
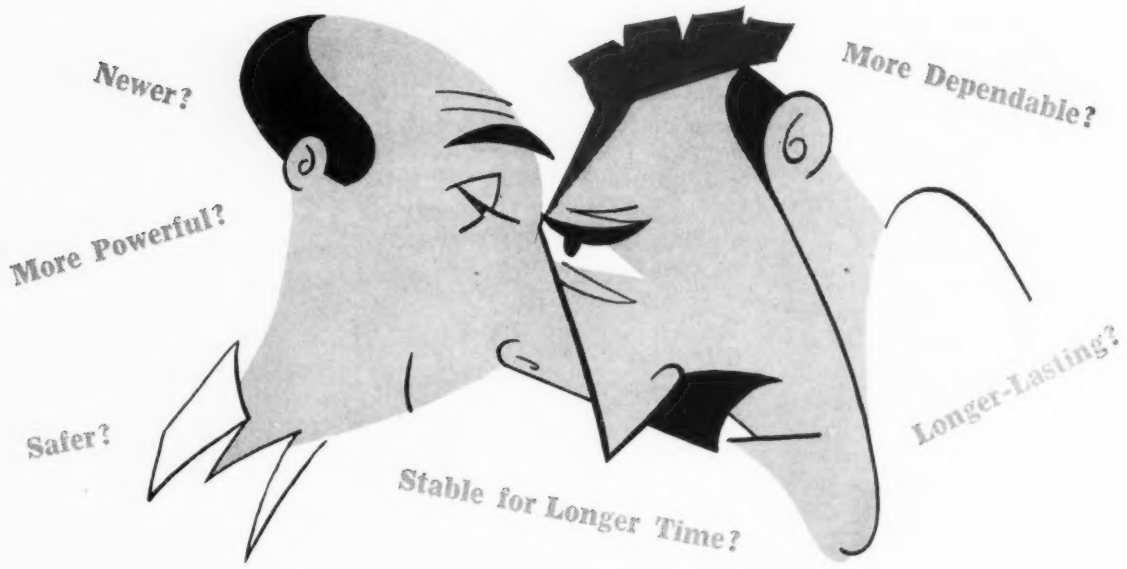


Figure 2



Let's face it!



When you talk about Insecticides you want RESULTS, *not just words*

Does "more powerful" mean better results? How long is "longer-lasting"? Is a product better because it's "newer"? Words are really meaningless when you consider the true measure of an insecticide in terms of *results on the job.*

As a matter of fact, any insecticide must be adequate to achieve control for its recommended use. Exaggerated claims cannot replace actual experiment station results and actual practical experience in the field.

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there will be an excess of water in the presence of "Chlorothene." All of the other metals tested exhibited slight corrosion except iron which reached a corrosion rate of about eight mils per year.

The presence of excess water with "Chlorothene" gives rise to another phenomenon. It will hydrolyze rather slowly at room temperature but as the temperature increases the hydrolysis rate also goes up quite rapidly. In the studies which have thus far been completed in glass with three mols of water to one mol of "Chlorothene" there will be a reaction which converts "Chlorothene" at a rate of approximately 0.365 grams per 100 grams of "Chlorothene" per year at 70°F.

At 120°F. the rate increases to the point where 8.4 grams of "Chlorothene" will be hydrolyzed per 100 grams present per year. As work in this area continues it is becoming more apparent that the hydrolysis must be occurring almost entirely in the aqueous portion of the three-phase system. By three-phase I am referring to "Chlorothene," water and the air over the mixture. In the near future we will have more data which will enable further clarification of this point.

This possibility is quite well supported by the results of a recent series of aerosol can corrosion tests. There is good evidence from corrosion studies in aerosol cans which indicates that the considerable dissolved water can be present in "Chlorothene" before hydrolysis or corrosion will become a problem. For example, "Chlorothene" containing .03 percent water and mixed in a 50:50 ratio with propellent 12 did not cause can corrosion on any of the aeosol cans tested for one year at 75°F. This included cans made from ½ pound tin plate and which had been prepared by drawing methods. In can corrosion tests made with the "Chlorothene" saturated with water, corrosion was evident in the vapor phase but not in the liquid phase. This corrosion occurred under the moisture droplets which had condensed in the vapor phase from the saturated "Chlorothene." Thus, some water in "Chlorothene" can be tolerated without producing evidence of corrosion. However, when undissolved water is present some corrosion occurs.

Effect on Fibers

PROBABLY one of the most interesting aspects of the use of "Chlorothene" in general cold cleaning and aerosol applications is the fact that it has very little effect on any of the currently used natural or synthetic fibers or on most of the common surfaces found in homes and in industry. The one exception to this last general statement is the adverse effect of "Chlorothene" on plastic wall tile. In an intensive investigation of this property, samples of insecticide and room deodorant formulations were prepared containing "Chlorothene" in varying concentrations. These were then sprayed on plastic wall tile at varying distances. This work indicated that "Chlorothene" in concentrations from 20 to 25 percent, could be used without damage to the wall tile at a three-foot spray distance. In these tests it was also discovered that methylated naphthalene type solvents used in insecticidal formulations containing DDT caused considerable damage to plastic wall tile, particularly at short spray distances which allowed a liquid film to build up on the surface of the tile. Room deodorants formulations prepared with five percent diethylene glycol would allow the use of higher concentrations of "Chlorothene" before damage became apparent on the tile. This latter effect was considered to be the result of the dilution of the "Chlorothene" by the rather inert and high boiling glycol.

Aerosol Applications

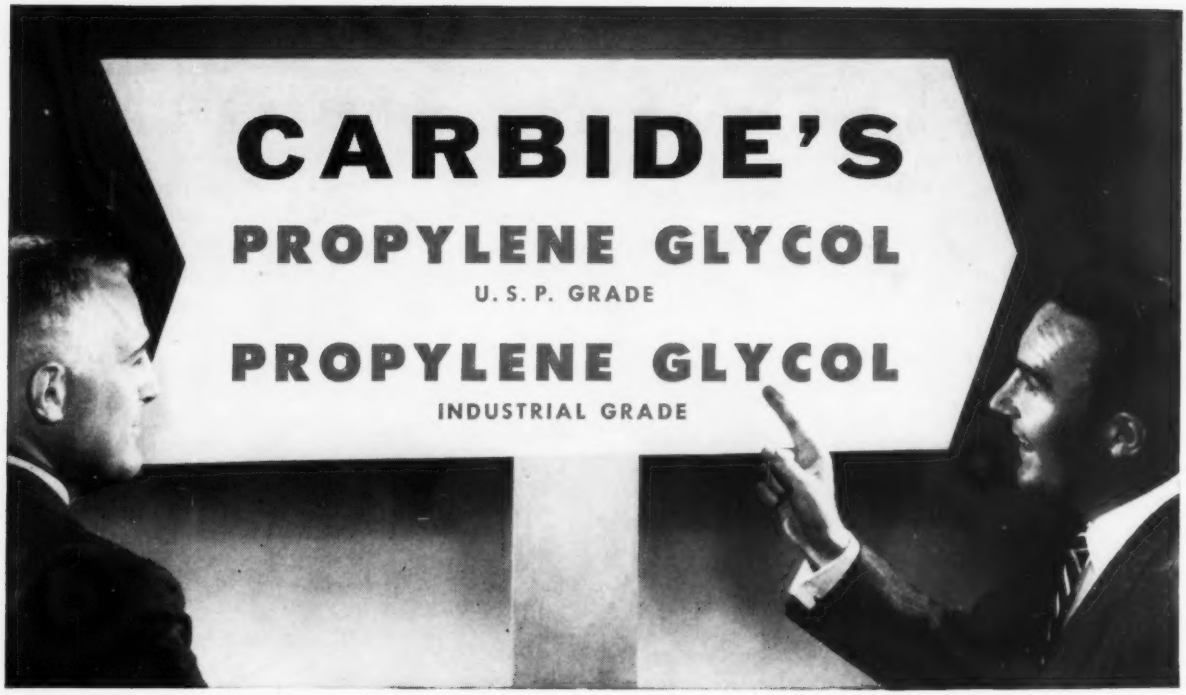
HAVING considered all of these factors and properties of "Chlorothene," where does it fit in the aerosol formulation picture? We believe that "Chlorothene" will be very helpful in reducing formulation costs in insecticidal and non-personal deodorant and reodorant formulations. "Chlorothene" in concentrations from 20 to 50 percent by weight of the total can be considered in these applications. In a recent study with a new reodorant composition, "Chlorothene" was found to produce the best formulation.

The aromatic under study was a complex mixture formulated to give older cars a new car odor. It was believed that the best and most convenient application of this aromatic would be found in the aerosol method. A compatibility survey indicated a large quantity of isopropyl alcohol was required to keep the aromatic in solution in a 50:50 mixture of propellents 11 and 12. In fact, so much alcohol was required that the formulation became flammable. Total substitution of propellent 11 with "Chlorothene," plus a small amount of alcohol, resulted in a stable solution of the aromatic at the required concentration. This formulation was found to be non-flammable in flame extension tests.

In aerosol formulations designed for spotting and treating fabrics and cleaning surfaces "Chlorothene" is definitely indicated. One general formulation, for example, containing from 60-80 percent "Chlorothene" by weight and from 40-20 percent propellent 12 is useful for general spotting and gum removal from fabric, cleaning walls (pencil, lipstick and crayon marks, cleaning typewriters, and other office equipment, removing tar from automotive finishes and white sidewall tires and for removing rubber cement and adhesive tape from various surfaces. These are but a few of the potential uses of this basic formulation. All of this is accomplished with little toxic hazard and minimum surface damage.

Finally, "Chlorothene" may soon find another area of application in aerosols. Recent cooperative tests with G. Barr and Company have indicated that from 25-30 percent "Chlorothene" may be used in hair lacquer formulations without increasing the toxicity hazard over that now encountered in

(*Turn to Page* 209)



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- KROMFAX *Solvent (Thiodiglycol)*
- *2-Ethyl-2-Butyl Propanediol-1,3*
- *2,2-Diethyl Propanediol-1,3*
- *Hexylene Glycol*
- *3-Methyl Pentanediol-1,5*
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Resins in Emulsion Floor Finishes

By Charles O'Connor*
Shanco Plastics & Chemicals, Inc.
Tonawanda, N. Y.

THE impact of synthetic materials started to be felt by the protective and decorative coating industry over fifty years ago. Resins have, step-by-step, been invading one field after another.

Unfortunately in the early days of the invasion the words "inferior" and "synthetic" became almost synonymous.

We, who are behind the scenes, view these new materials in a strictly impartial, scientific light. We formulate to utilize their good points and try to circumvent their weaknesses. We still have our leanings toward carnauba wax and shellac. We probably will for years to come, for the products of nature can be very difficult, if not impossible to duplicate.

Before the turn of the century, people were working to make a synthetic shellac. No one has succeeded, though the natural product has been replaced in several industries by synthetic materials which do a superior job.

The same general situation exists with carnauba wax. Ten years ago, there were those who insisted that they would soon be using no carnauba wax. However sincere they may have been, and however close they may have come to such a condition, it is obvious from the sales of the product, that it is still very much in use in the wax industry.

Regardless of how much we may like to gloat over the fact that organic chemists have failed to synthesize shellac or carnauba wax, we must admit that the problems involved are slowly but surely being by-passed.

* Paper presented during 43rd annual meeting Chemical Specialties Manufacturers Association, Washington, D. C., Dec. 5, 1956.

Effect of Alkyds

THE effect of the introduction of alkyd resins has been to replace almost completely open kettle processed varnishes in the protective coating industry "steam-set" resins and "heat-set" resins have made tremendous inroads in the graphic arts industry. You may think of these as age-old industries, and wonder how an industry so comparatively young as the wax and polish industry came under influence of these new tools of formulation.

It is not the age of the industry, but the imagination of its technical men, which determines how fast and how completely changes take place.

So long as carnauba wax remained the major component of wax and polish formulas, the position of wax compatible resins remained one of providing slip resistance, and stabilizing costs. With the advent of oxidized micro-crystalline waxes the use of these resins became a must and they came to be a permanent part of the wax maker's thinking.

While the floor wax producer thought of shellac only as a levelling agent the field of alkali soluble resins was limited to one of improving gloss and water-spot resistance

About ten years ago, when the position of shellac and wax in floor wax formulas, was completely reversed it opened wide a very large door into the future. New problems, however, were encountered by floor wax producers. Buffability, the simplest refinishing method yet devised, was gone. When the film became dull, it had to be removed and replaced. Water spot resistance was gone. Shellac, no longer protected by a predominance of wax, oxidized and turned brown and insoluble. Build-up outside of the traffic lanes became more noticeable, particularly on the new and lighter colored floor coverings. Something had to be done! Something was done! Some people with the courage of their convictions said, "Our stock in trade is *wax* and *removability;* we will go back to the high wax formula."

Some said, "Nothing to it. We will make a special remover." There was a stroke of genius! In a day and age when every vendor to the consuming public was selling a product which was easier to use, or required less labor, or did the job automatically, someone came out with a product to make more work. If that one lives very long, floor finishes salesmen are geniuses.

The third group decided that the high shellac type of formula had some merits which appealed to them and they would try and eliminate the troublesome ones.

The purpose of this article is to discuss some of the ways in which various synthetic resins may be used to help us.

Prior to the advent of the high shellac formula, wax compatible phenolic resins had become part of the floor wax industry's thinking. In high wax formulas of today, wax makers are consuming more resins than ever. It is quite possible that resins are one of the components of the wax portion of

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high shellac formulas. If the wax maker is using oxidized microcrystalline wax, resins should be included.

Before we pass along to other kinds of resin, I would like to leave one thought with you. I haven't a shred of evidence to back it up in the floor wax industry. But, the first use of phenolic resins by the paint and varnish, printing ink and printed floor covering industries was as an anti-oxidant or an anti-skinning agent. It is quite possible that if they were used in sufficient quantity in the wax portion of the floor wax formula, they might help to stabilize the shellac.

Alkali Soluble Resins

IT is with the 20 percent of shellac solution that we find the bulk of our headaches, heartaches, compensation, and glamor. It is the reason for over four thousand samples and a pile of reports over five feet high.

With emulsion wax base well established, floor wax makers bent their efforts to finding a shellac replacement. We worked with the manufacturers of such waxes. At first their requirements were modest. The resin had to dissolve in ammonia to produce a clear solution which would be compatible with the wax emulsion. We made such a resin and started to sell a few drums. Over the years, requirements of floor wax producers have increased to include every possible property that could be built in. We have never produced them all in any one resin. It is quite possible that we never will. We have probably produced for the floor wax producer a greater variety of this type of resin than the rest of the resin industry combined. The original resin has grown to about a dozen presently being sold by us. The original few drums sold in the first year have grown to many carloads sold in the past year. For this we are most grateful.

We are sometimes asked, "Why so many alkali soluble resins?"

The answer is rather simple. No perfect alkali soluble resin has yet been built. Various formulations place different values on the combinations of properties which can be built into any one resin.

We made four emulsions suggested by various wax and emulsifier manufacturers. To these we added equal quantities of the same alkali soluble resin. Three showed good gloss, leveling and heat stability. The fourth went solid in three days in a heat test. Another of our alkali soluble resins showed excellent heat stability with the fourth wax.

It may be felt that if an experienced wax man had done the formulating in the case of the fourth wax, no difficulty would have been experienced.

We took a group of six emulsion wax bases, containing no leveling agent, which our customers sent in for us to select our best alkali insoluble resin. One resin worked with three, a second resin worked with two others and a third resin worked with the sixth emulsion.

All six are in production today with our resins. If we had only one resin available, at best we could have satisfied only three customers.

We know, that for one wax formulator, other factors may be brought to bear on the choice of raw materials than those which may influence another formulator half way across the country or half way around the world. So, until someone comes along with a resin with all of the good points of shellac and none of the bad ones: with all of the good points of a synthetic and none of the bad ones; we will continue to make enough to keep the wax maker happy if not satisfied.

If we have gone along with the floor wax producer in his thinking and have made the resins for which he asked, I trust that we may be excused for not always agreeing with him.

About three years ago, doubts about the path that we were both taking began to crystallize into a definite pattern. Every resin that we were building, regardless of its chemical composition, had to be modified so that it would form a salt or a soap. This was the way it was introduced into the floor wax formulation. We were making resins which otherwise would have had the strength and chemical resistance to be in a molding compound, a laminate, a cold set glue, and so warping them around that they would make a soap. None of them were any more compatible with wax than they were with shellac, so we couldn't introduce them directly into the wax. We concluded that instead of making the soap part of the molecule, we should surround the resin with soap. This was nothing new. It was a simple emulsion.

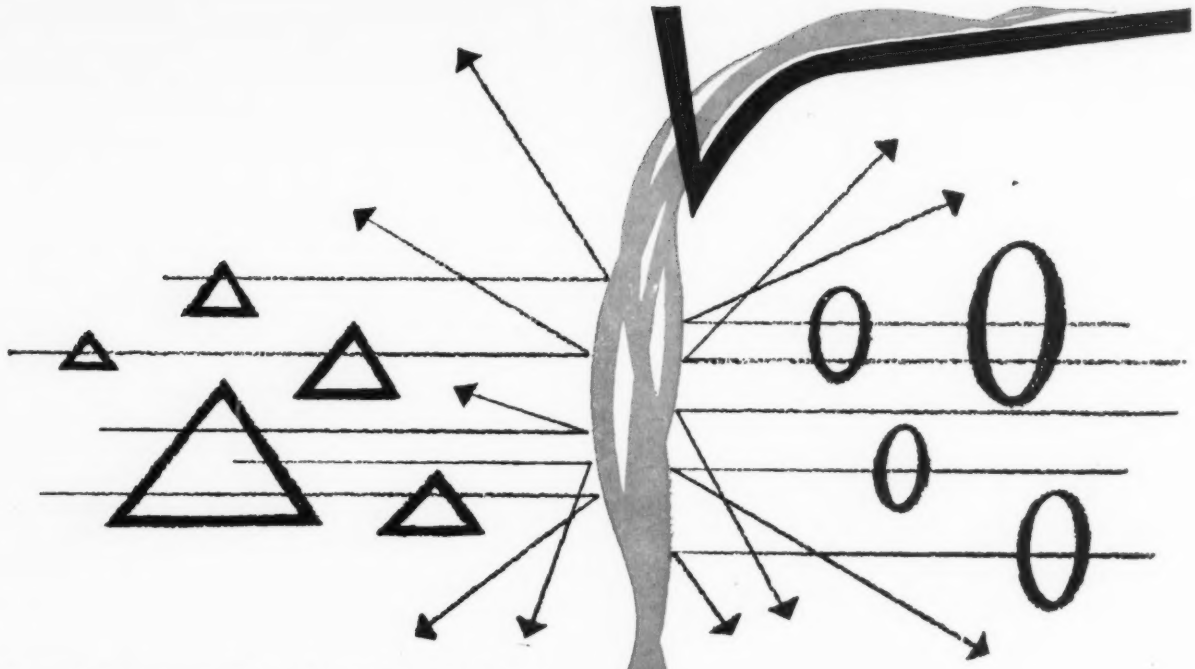
We felt that this was not the proper way to market it. The wax makers were in the emulsion business and wouldn't want to pay freight on water. Subsequent events have proven that this was a false premise.

At any rate, we compromised on the project and produced two resins. One could be dispersed quite readily but it could also (unfortunately) be made into a soap. The other dispersed quite readily but was quite difficult to make into a clear solution.

It might be interesting to know what happened to them. The first fell flat on its face. I do not think that we ever sold a drum of it. The second rose to great heights as a dispersion? No! The floor wax makers beat the ears off of it until it made a clear solution. They apparently like it that way because they have used a lot of it even if it hasn't been the way we planned.

In the period of three years between the launching of these trial balloons and the present, wax formulators have become interested in resin emulsions and have actually used them in their production. They are fascinating things and have a great future.

Before we start a discussion of them, come behind the scenes



No oxidation, no rancidity—after a year and a half of storage! And during that time the sample (Neo-Fat® 94-04, Low Titer) was opened to the atmosphere every month for the first 6 months, every 3 months thereafter.

In the Mackey Test (which measures resistance to oxidation, based on the time required to reach 105°C), the swatch soaked in Armour Red Oil revealed no discoloration from oxidation after 5 hours 30 minutes. Yet, two swatches soaked with other well-known red oils charred and reached the point of internal combustion after 2 hours 5 minutes and 1 hour 5 minutes, respectively.

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Color, Lovibond 1"	—	3R—15Y
Mackey Test	5 hrs.	—

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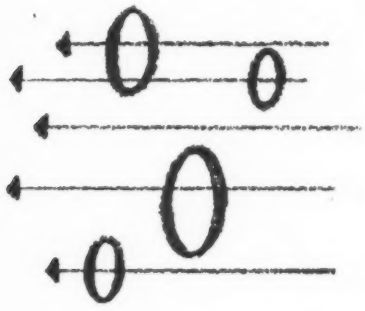

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for a moment and watch us wrestle with a problem.

Resin Emulsions

WE visualized a hard tough resin which we could ship in lump or ground form. There would be no water, no special containers, no unusual handling problems. It was to be just an ordinary looking resin which the wax maker could dump into his shellac or alkali soluble resin cutting equipment. Instead of producing a solution, it would form a resin dispersion.

This turned out to be quite an order! Though we had made hundreds of resins, they all had been so modified as to form soaps. We had to eliminate them, now, on a basis of their film forming properties and compatibilty per se. After we put them through the first screening, we had to determine the best way in which to produce them. We had three basic methods: 1. Direct reaction of the components. 2. A reaction in solution and subsequent evaporation of the solvent. 3. React them in suspension in water and then dehydrate or coagulate and dehydrate. It was probably a combination of things which made us first try the emulsion method: the wax maker used it in his process (at least the first part of it) and great quantities of synthetic rubber are produced that way. It is quite simple and heat control is not a problem.

We made a large number of resins and selected those which we thought that the wax formulator could use. Then the problem really started. Have you ever tried to emulsify a molded ash tray or a piece of crepe rubber?

At times, we thought that we would have to sell the wax maker a five thousand dollar homogenizer before we could sell him our first drum of resin. We almost reached the point of giving the wax formula and telling him to go into the resin business.

Needless to say, we have licked the problem or I would not be writing about it. Shanco "340" is a reality.

Now we had to take stock. Would this new type of resin mark the end to our years of work on alkali soluble resins? The quickest answer came in the recommendations for new materials. No new material offered in the last two years, with which we are familiar, fails to recommend one of the alkali soluble resins that we were asked to make. This new type has great water resistance. This is a very desirable feature but it must be brought under control. This is best accomplished with an alkali soluble resin. Now we can combine two stable synthetics to give a permanent degree of removability. There are other interesting properties which we shall discuss later.

Shanco "340" resin as it comes from the reactors is a very viscous mass. It cools to a hard, tough, hornlike resin which has very high surface luster. The material is ground into a coarse powder containing particles ranging from 10 to 80 mesh. It is shipped as a dry powder in 55 gallon fiber drums. It can be converted to a fine particle size resin dispersion in your laboratory as follows: Heat 237 grams of water in 600 cc. beaker to 190°F. Add 21 grams of 28° Be ammonia. Start a small mechanical stirrer turning so as to give good stirring with a minimum vortex. Sift in 42 grams of Shanco "340" resin. Maintain a temperature of at least 190°F. and regulate the stirrer so that a minimum of air is whipped into the batch. Maintain a pH of about 9 by adding ammonia as required.

Within 10 minutes, the batch should assume a milky appearance. Large, undispersed particles may be seen swirling around. In 20 to 30 minutes all of the larger particles should disappear. In 40 to 50 minutes there should be a noticeable change in translucency of a sample in a small diameter glass tube. If the tube is shaken, the "oiliness" characteristic of a good carnauba wax emulsion should be in evidence. Further stirring need only

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be used to make certain that no agglomeration is present.

The dispersion at the factory was to sub-micron sized particles. It is probable that they will not be further reduced by simple stirring. It is only necessary to see that each particle is separated from the next adjacent one by a thin film of liquid.

Improper dispersion will produce films ranging from low gloss to opacity. Do not add other components until the batch has been properly dispersed. The dispersion which we have just described dries with good gloss.

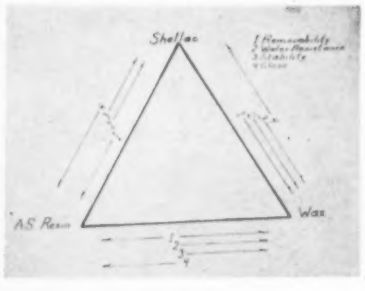
Position of Dispersion Resins

WE can now start to formulate with our "do it yourself" resin or with one of the ready made dispersions on the market.

First, they are not film formers by themselves. They can usually be made so by the addition of plasticizer. When properly plasticized, they form hard, tough films which have great water resistance. This is of a value far greater than any which we have been accustomed to secure from wax and shellac emulsions. Fortunately the films are quite stable. If we introduce an alkali soluble resin, we can control the degree of removability and have it remain throughout the usable life of the film.

In lieu of formulations, I would like to show several figures which illustrate a logical transition from a high wax formulation to a wax-free formulation. The changes are based on removability, water resistance, stability, and gloss. They may help to show graphically how this new tool fits into our scheme of things.

Figure 1



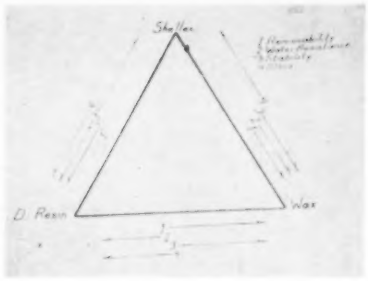


Figure 2

Figure 1 shows a three component system—shellac, alkali soluble resin and wax. The wax also may be a wax-resin blend.

Counting the arrows pointing to each item, it can be seen that six are for wax, three for shellac and four for alkali soluble resin. The general indication is toward a high wax formulation in which an alkali soluble resin is used in place of shellac. I think that this is quite common practice.

Unfortunately, the above formulation is limited to about 20 percent of any alkali soluble resin because the stability drops off rapidly and does not return until the wax content has dropped to about 10 percent. We do know of one commercial product which runs 93 percent of one of our alkali solubles and seven percent of a wax emulsion. The resin is a unique type which has many of the properties of a dispersion type.

We prefer to recommend that our alkali soluble resins be used only in the high wax type formulations. In such formulations they can and are being used as a complete replacement for shellac to produce a superior product.

In Figure 2 we have replaced the alkali soluble resin with a dispersion resin. The arrows now indicate five for wax, five for dispersion resin and two for shellac.

This time, it would appear that shellac has fallen to a poor third in a high wax formula. If we are going to formulate, we should use a high wax and a low dispersion resin content instead of shellac. We would have higher gloss and the removability should be stable with time. This against a decreasing removability with shellac. If we go too high in dispersion resin, we should decrease initial removability, but the removability should remain constant at whatever point we set it.

The next logical step would be to substitute alkali soluble resin for the shellac. We would then theoretically produce the optimum formula by being able to increase gloss at the same time that we were controlling removability. Our optimum formula then would consist of wax emulsion, dispersion resin and alkali soluble resin solution.

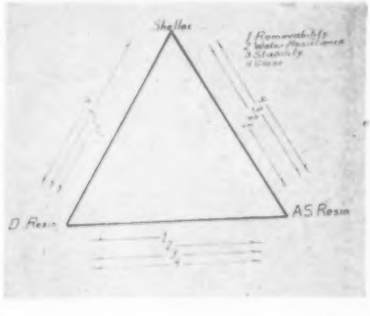
In Figure 3 wax rated five, dispersion resin rated five and shellac rated two. Since we rated the wax and the dispersion resin the same, let us remove the wax and substitute alkali soluble resin. We now have a three component system without wax.

If we replace shellac with some alkali soluble resin, we gain in gloss and removability. Our stability remains essentially the same. We lose some water resistance.

If we replace some of the dispersion resin with an alkali soluble resin, our gloss and stability remain about the same. We lose some water resistance to gain removability. With gloss and water resistance higher in the dispersion resin, it would seem logical to replace some of the shellac with some alkali soluble resin.

The numerical values, we leave to the discretion of the wax formulation. The formula makes a very attractive product. We feel quite certain that a substantial

Figure 3



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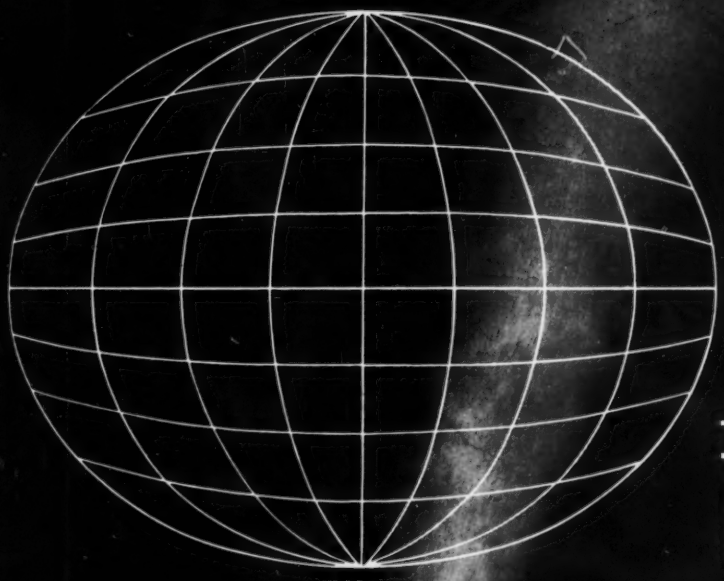

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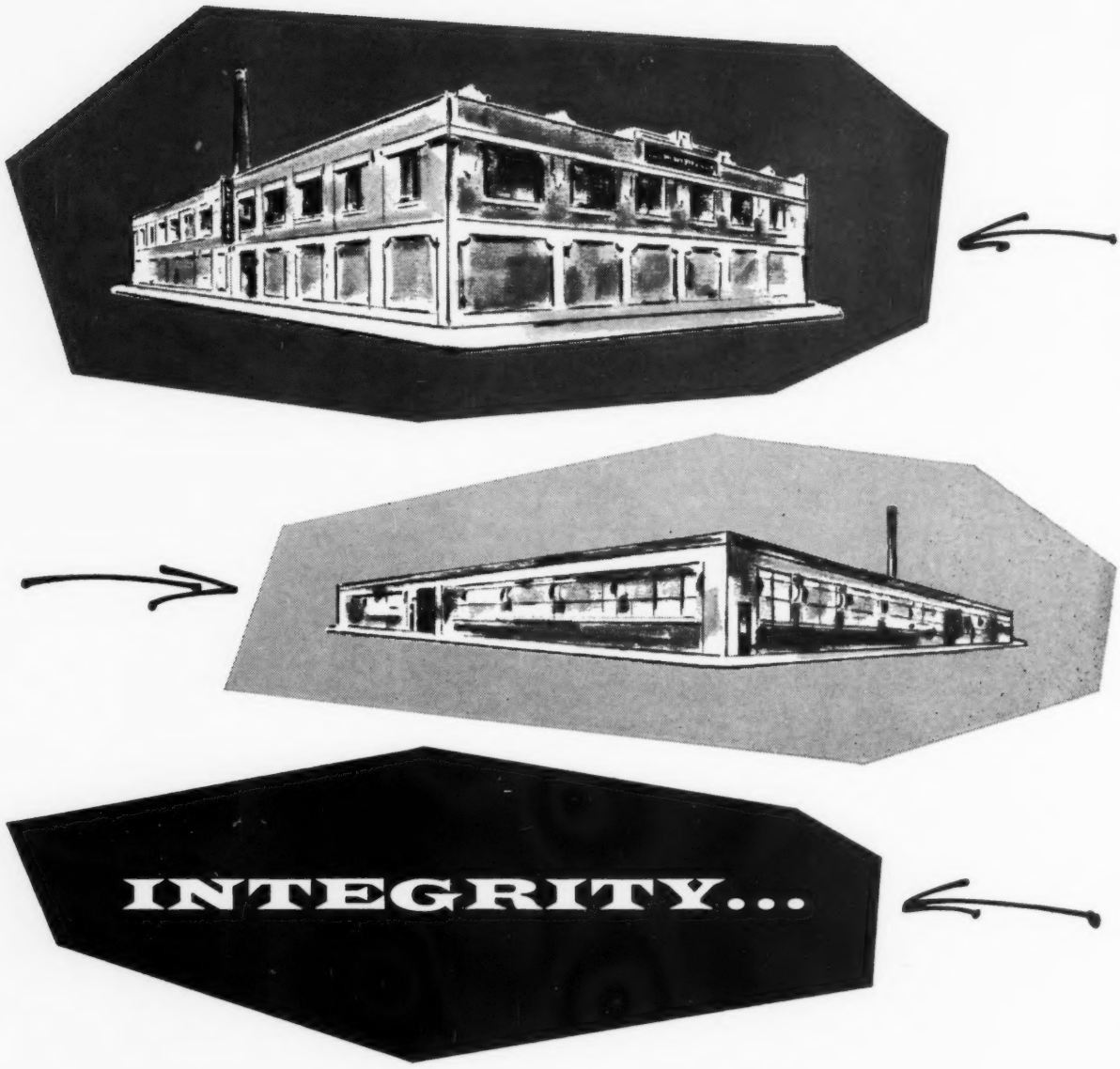

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quantity of it will be made.

In the resin dispersion portion, none of those presently available, including our "do it yourself" type are film formers. Each will need plasticizer. Our type will probably require five to ten percent. One of the better known modified styrene types will probably need 10 to 12 percent and some of the straight styrenes may require 15 percent. We would suggest that the wax maker check the plasticized film alone. If he over-plasticizes, he will lose the toughness and freedom from tack characteristic of these resins. In the subsequent attempt to regain hardness with added shellac, he will introduce brittleness.

The shellac solution will probably be the wax maker's present stock solution.

The alkali soluble resin will be influenced by the ratio of shellac to dispersion resin and the type of dispersion resin. Most of those on the market have ready removability. The choice would then be governed by gloss. We think that this indicates "Shanco L-1001."

Conclusion

WE have seen that this new tool, the dispersion resin, may be used as a complete replacement for shellac in a high wax formula or as a replacement for wax in a high shellac formula. How it is used is entirely up to the wax formulator.

I would like to leave this thought: the hallmarks of the floor wax industry are "wax" and "removability." Give up either one and you start to lose your identity as a separate part of the protective coating industry.

Insect Repellents

(*From Page* 87)

for effective repellents at a time when increasingly effective insecticides and more efficacious suppressive drugs for malaria and other arthropodborne diseases are available must be answered in the affirmative. Although area control of some disease vectors is successful, as for example, malaria control and eradication programs, this approach is contraindicated at the present time in some areas and for some vectors (*e.g.*, for malaria in some parts of Africa). Likewise, control by means of insecticides is not feasible in such areas as the circumpolar regions where populations of biting insects are extraordinarily dense and the nuisance value is high. Under conditions of these sorts a superior repellent would be a boon.

Furthermore, it is necessary to face the realization that the development of insect resistance to insecticides is an inevitable consequence of the increased use of insecticides. One advantage of repellents lies in the probability that insect populations may not become readily resistant to these agents. Because insects which are sensitive to repellents are not killed, but live to breed, there is less selection pressure for the development of repellent-resistant strains. There is, of course, the possibility that the insects which are repelled experience greater difficulty in obtaining blood meals and, as a consequence, cannot compete in breeding with the insects which are resistant to repellents and readily obtain blood despite the repellent. Whether or not this difference confers a disadvantage on the former so that they cannot compete reproductively with the resistant ones remains to be discovered. No investigations into the possibility of the development of resistance to repellents have been undertaken. This is a question worthy of some attention.

(*To be concluded*)

Taylor in New P&G Post

James H. Taylor has been named to the post of manager of the newly-created personnel administration department, it was announced last month by Procter & Gamble Co., Cincinnati. In his new assignment, Mr. Taylor will supervise the planning and maintenance of a company-wide personnel program. Mr. Taylor joined P&G in 1936 and since 1948 has served as director of industrial relations.

Chemical Salesmen Elect

Vincent L. Rebak, New York district sales manager of Grace Chemical Co., was installed as president of the Salesmen's Association of the American Chemical Industry at a luncheon meeting at the Hotel Commodore, New York, Jan. 24. Mr. Rebak joined Grace in 1953. He was formerly associated with Heyden Chemical Corp. and Dodge & Olcott, Inc.

Vincent Rebak

Others who took office include Robert J. Roberts, Emery Industries, Inc., vice-president; James E. Spencer, Harshaw Chemical Co., treasurer; George W. Poland, Jr., E. M. Sergeant Pulp & Chemical Co., secretary. New directors include Jerome F. McGinty, Millmaster Chemical Corp.; L. P. London, E. I. du Pont de Nemours & Co.; Stewart Cowell, J. T. Baker Chemical Co.; John Seidler, Whittaker, Clark & Daniels, Inc.; and Frederick A. Koch, Dow Chemical Co.

—★—

CAIA Elects Hicks

J. Glen Hicks, Monsanto Chemical Co., St. Louis, has been elected president of the Chemical and Allied Industries Association, Detroit, it was announced recently. Other officers elected for 1957 include Wayne E. Luff, Mallinckrodt Chemical Works, St. Louis, vice-president; Daniel F. Bradley, Shell Chemical Co., New York, secretary; and Bruno Cheradini, J. T. Baker Chemical Co., Phillipsburg, N. J., treasurer.

Drackett Elects Wise

Election of R. D. Wise as vice-president of the plastics division of Drackett Co., Cincinnati, was announced last month by Roger Drackett, president. Mr. Wise joined the company in 1946. In 1954 he was elected vice-president of Drackett Products Co., and a year later was named president of Calmar Distributors, Inc., a subsidiary of Drackett. For the past several months he has been in charge of the firm's plastics operations.

★

Lueders Expands

George Lueders & Co., New York, has signed a long-term lease for 50,000 square feet in the new Island Industrial Park, at Patchogue, N. Y., it was announced recently. Lueders, manufacturer of essential oils and aromatics, has other branch offices in Chicago, San Francisco and Montreal.

New Montrose Pesticide

Montrose Chemical Co., Newark, N. J., recently announced that the U. S. Department of Agriculture has approved commercial use of its "DDVP" (dimethyl 2,2-dichlorovinyl phosphate) in flybaits and for control of phorids in mushroom houses. The formula was discovered by Dr. George Pearce and previously had been authorized only for experimental use.

NOW! ONE OF THE OLDEST AEROSOL COMPANIES BECOMES A

NEW SOURCE FOR CUSTOM FILLING

GARD—one of the oldest and most experienced manufacturers in the aerosol field—announces the formation of a new, separate division designed to meet the growing needs for "controlled quality" custom filling.

As the pioneer of high-speed pressure filling, producer of the first over-the-counter pharmaceutical aerosol and manufacturer of their own fine line of aerosol products, GARD brings to the field of custom filling the same technical, manufacturing and marketing experience . . . product research and development . . . and "controlled quality" techniques that have made GARD "the greatest name in aerosols." GARD offers a complete aerosol service, backed by experts who know and understand aerosols.

Whatever your product—solvent or water base, from cosmetic to paint, spray, foam or powder for home or industry—whether it's packaged in metal, glass or plastic under cold or pressure filling—whether you need 100 or 1 million units—GARD custom filling serves you best. Strict "controlled quality" measures assure superior quality, uniformity and stability in the production of outstanding aerosol products that proudly bear your label.

For full information regarding contract filling of your products, write today to the

CUSTOM FILLING DIVISION
GARD INDUSTRIES, INC.
"The Greatest Name in Aerosols"
731 GREEN BAY ROAD • WILMETTE, ILL.

GARD

Supplying Detergent Alkylate

(*From Page 53*)

Trend to Liquids

THE most pronounced trend in the detergent industry in recent years has been the rapid growth of liquid products. Figure VII shows the average composition of light-duty, liquid formulations. For this use it is generally desirable to have less than two percent inorganic salt, based on the sulfonate present, in the final detergent. Figure VIII shows the minimum salt contents which can be achieved with various sulfonating agents. With 100.8 or 105 percent sulfuric acid, the minimum salt content based on active ingredient is nine to 10 percent following "watering-out" of excess sulfuric acid. When these sulfonating agents are used in preparing liquid formulations, it is necessary to desalt the sulfonate. This is normally accomplished by alcohol extraction. One can eliminate this desalting step by employing sulfur trioxide as the sulfonating agent. Considerably more heat is evolved in this process than when oleum is used so that some color degradation is likely to result. With proper equipment, however, one can produce reasonably light-colored products containing less than two percent salt suitable for use in liquid formulations. Dodecylbenzene suppliers have done considerable work in determining the optimum conditions and equipment for sulfonation with sulfur trioxide. Equipment manufacturers and suppliers of sulfur trioxide have also made major contributions to this method of sulfonation. Information from

these sources is readily available to the detergent manufacturer.

Figure IX shows typical laboratory tests which the dodecylbenzene supplier uses to check the quality of the sulfonates from his product.

In order to approach as closely as practical the condition encountered in actual use, our laboratory employs full scale household laundering equipment. Practical testing of detergents may be defined as a reproduction of home washing under laboratory conditions. From such testing, data are obtained regarding, among other things, foaming and detersive characteristics of detergent formulations.

A program for practical testing of detergents is divided into three parts:

(1) Towel preparation and distribution for soiling;
(2) Detergent preparation and use;
(3) Evaluation of data.

FIG. IX

TYPICAL EVALUATION TESTS

DRAVES WETTING

ROSS - MILES FOAM

SURFACE TENSION

ACTUAL USE TESTS
- DISHWASHING
- LAUNDEROMETER OR TERG-O-TOMETER
- FULL SCALE HOUSEHOLD WASHING MACHINE

In the preparation of the towels, grommeted individual towels of Indianhead cloth, 12 x 14 inches each are first desized by washing 100 towels in 12.5 gallons of 130°F. soft water containing 50 gms. of Calgon. Following drying, the initial reflectance is determined as outlined by Sanders and Lambert (*J. Am. Oil Chemists Soc.*, 27 153 (1950)). A normal test program consists of eight detergent formulations tested at two water hardness levels (usually 50 and 600 ppm). This entails 16 groups of towels. Statistical considerations show that 24 towels per group give results of satisfactory significance. At this point, then, we have 16 groups of 24 towels each for a total of 384 towels. Each of these 16 groups is further subdivided into four groups of six towels each, to correspond with the four soiling stations used. These latter are, in our case, usually washrooms located in various parts of our Ponca City refinery. Especial care in selection of the soiling stations is necessary so as to avoid unconventional soiling of the towels. The subdividing of each group of towels was found necessary to correct for day to day variations in soiling intensity.

The distribution of the towels for soiling is planned so that at the completion of the testing program, each towel has been soiled once at each soiling station and each such soiling followed by washing in the assigned detergent formulation at the assigned water hardness level. Following four soilings and four washings, the so-called "washed" reflectance is determined on each towel.

We are usually concerned only with correlation of variations in active material with detersive properties, so the same builder formulation is used in all cases. Usually the concentration of detergent used in practical testing is 0.25 percent. Scouring time is eight minutes, with foam height in the washer being measured at 0 + 1 and 0 + 6 minutes of the scouring cycle. By statistical, as well as graphical means, correlations are obtainable between molecular structure of active material and detergency properties.

Dodecylbenzene sulfonate has long been known as the "work horse" of the detergent industry. Figure 10 shows the phenomenal growth of this product during the post-war years. At the present time there appears to be no leveling off in production of this product. The continued cooperation of the dodecylbenzene supplier and the detergent manufacturers should result in further quality improvements and still further increases in production.

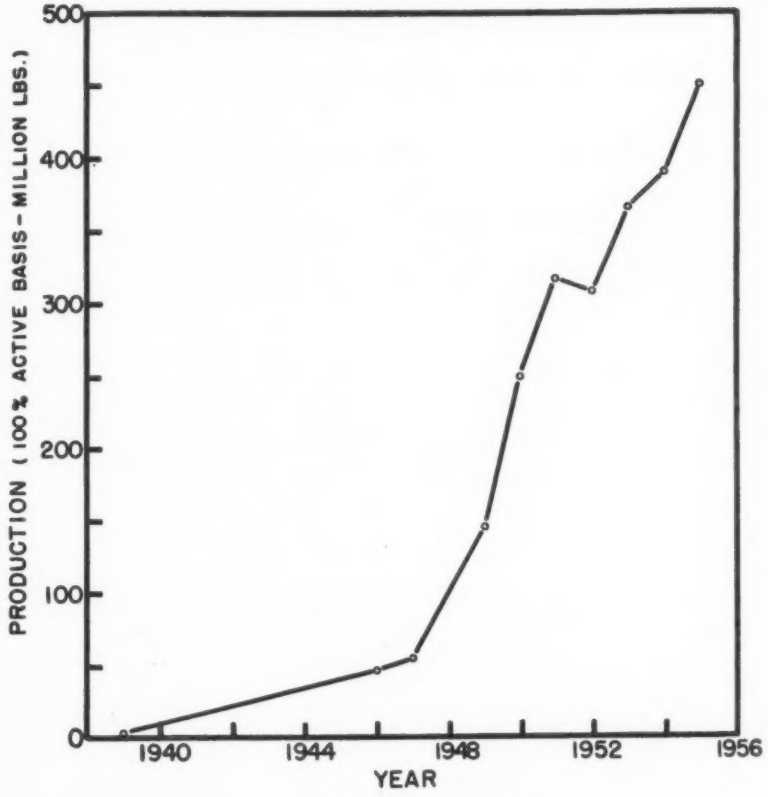
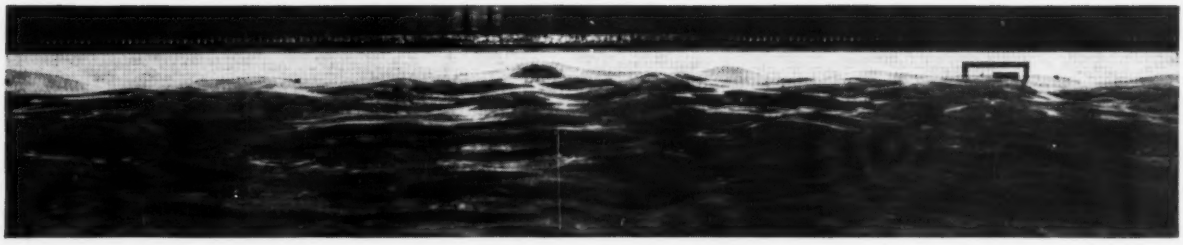


FIG. X ALKYLARYL SULFONATE PRODUCTION
(SOURCE: U.S. TARIFF COMMISSION)

"Another product safely shipped in Inland 'protection-eered' containers"*

what's wrong with this picture?



That's easy! Mr. Smith is about to paint a swimming pool with ordinary house paint! Those who know . . . use a special paint. A paint such as Ramuc Pool Enamel made by Inertol Co., Inc., Newark, New Jersey. Inertol knows, too, that it would be a commercial "faux pas" to rely on ordinary shipping containers to keep their special, protective paints free from discoloration and contamination. That's why they use Inland "protection-eered" containers specially lined to maintain the purity of their products during transit, storage and use.

Do you have packaging problems? Why not let Inland's lining experts help you solve them. Write for complete details to Bob Boecher, Dept. 330D

**the right container, with the right lining for your product*

INLAND STEEL CONTAINER COMPANY

Division of Inland Steel Company • 6532 South Menard Avenue • Chicago 38, Illinois • Plants: Chicago, Jersey City, New Orleans, Cleveland and Greenville, Ohio

Full line of steel and stainless steel shipping containers, including galvanized and heavy duty ICC drums.

INLAND

"It's Better to Ship in Steel"

Packaging...

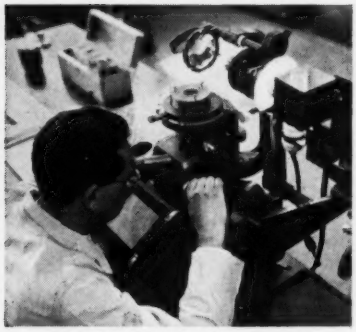
AEROSOLS · LIQUIDS · PASTES · POWDERS

Announcement of formation of a new aerosol custom filling division of Gard Industries, Inc., Wilmette, Ill., was made last month by Howard G. Klehm, president. The new division, according to Mr. Klehm, will handle both solvent and water base products in spray, foam and powder forms.

Automotive Chemicals
Cleaners
Detergents
Deodorants
Disinfectants
Floor Products
Insecticides
Laundry Bleach
Metal Cleaners
Moth Products
Polishes
Shampoos
Shave Products
Soaps
Liquid Starch
Toiletries
and other
Chemical Specialties

A market for over 20 billion packages annually

OWENS-ILLINOIS ASSURES YOU A



Co-ordinated Research

Pure research into formulae and fabrication of glass, *packaging research* into processing and handling methods in customer plants, and *market research* into consumer attitudes, add up to greater specific value for your packaging dollar.

Engineered Design

The package that takes your product to market must take *three* needs into account. Considerations of its function in the retail store, its operating efficiency and its consumer utility all become a part of the prescription for an Owens-Illinois package.

The Right Container

Facilities at Owens-Illinois are versatile. Talents are varied and many. So you can count on obtaining a container exactly suited to your needs—one that blends salesmaking beauty, product protection and utility in the proportions required to attract customers.

Battery Acid, Tire Cleaner or Auto Polish—

Cómplete Packaging Approach

The Right Closure

Know-how as to the best available liner and closure—best for packing, displaying, or using a specific product—may well be one of the most important single points through which expert packaging counsel will reward you many times over.

Needed Fitments

With emphasis on the word "needed," Owens-Illinois specialists are keenly aware of sales benefits possible through use of plastic shaker and pour-out fitments which are not "gadgets" but which increase consumer satisfaction with your product.

Merchandising Cartons

Modern cartons are developed only through systematic consideration of their opportunity to serve you in the retail store and retail warehouse as well as on your own filling line and in transit. Owens-Illinois is pioneering such developments.

you can ride to greater sales . . .

with an Owens-Illinois package that sells through convenience in use

It's a well known fact that in addition to a good product one secret to greater sales is a well designed and engineered glass package.

Glass does more than let customers see what the product looks like. It adds a sparkle and eye-catching appeal to packages displayed in the store. An attractive, easily recognized package means more repeat sales, too.

In addition, a glass package protects the contents, shows the supply available and maintains good quality throughout many openings and closings. There's no waste or spoilage, either. A distinctively designed glass package can give your advertising campaign a tremendous boost.

Market-minded designers at Owens-Illinois will help you plan a well styled glass container with a powerful merchandising appeal all of its own. Owens-Illinois can provide glass containers of all types, capacities and designs.

DURAGLAS CONTAINERS
AN (I) PRODUCT

Owens-Illinois
GENERAL OFFICES · TOLEDO 1, OHIO

Aerosol Aeroservice

President Clarence F. Carter and Sales Manager Jack Campbell, of Continental Filling Corporation check flight plan before take-off.

Continental Filling Corporation executives fly thousands of miles to bring aerosol filling service right to your door.

This "aeroservice" is an example of the alertness, coupled with technical knowledge, that has made Continental *first* in the development of many advances in the aerosol filling industry.

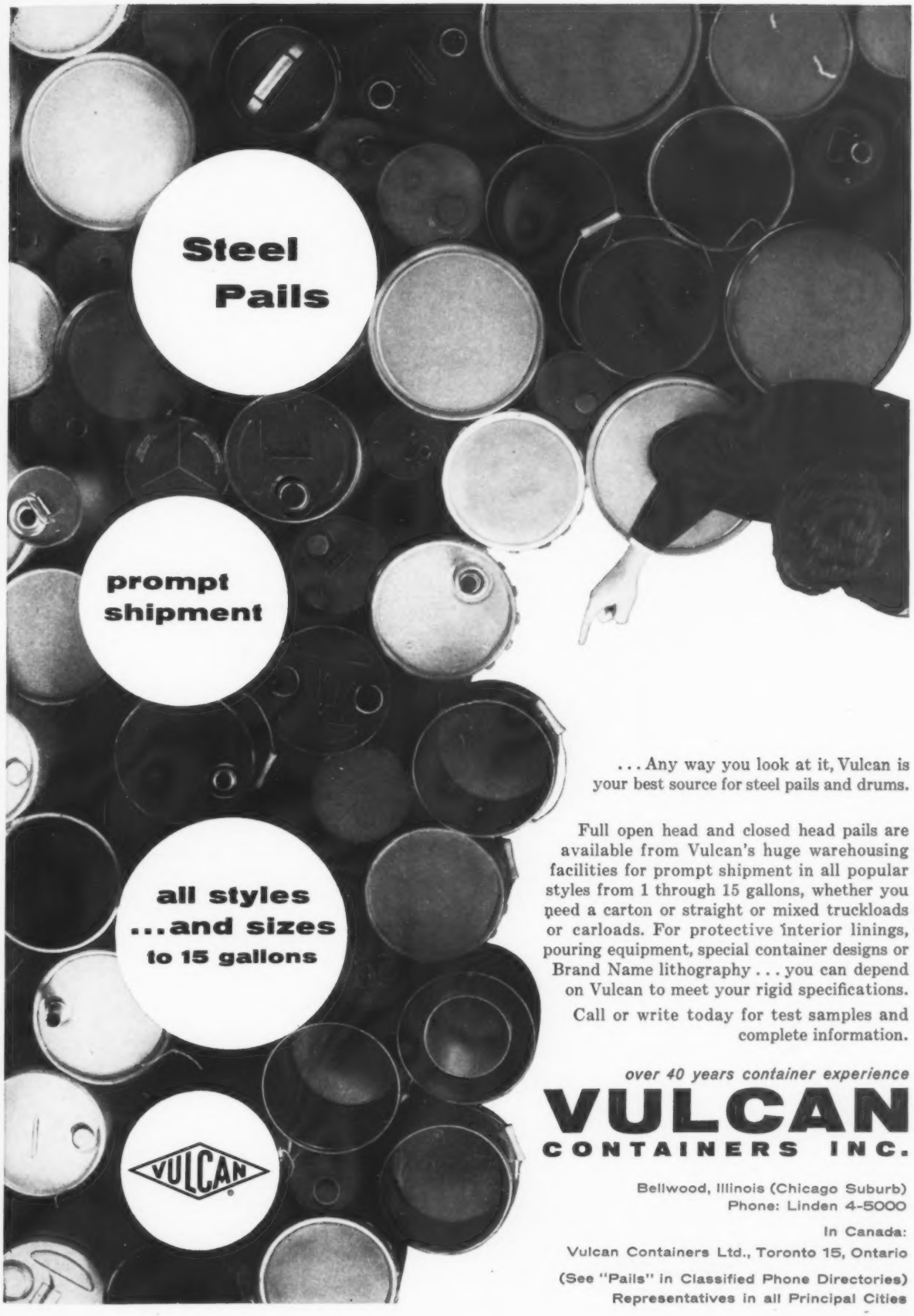
Direct shipping via four railroads, a dozen truck lines and a large airport speeds Continental's delivery service to you and your customers.

Call Continental Filling Corporation and watch this aerosol "aeroservice" go to work for you.

Write today for this free booklet. A limited number are still available.

CONTINENTAL FILLING CORPORATION

MAIN OFFICE: 123 N. Hazel, Danville, Illinois, Phone 742
N. Y. OFFICE: 527 Lexington Ave., New York 17, Phone PLaza 3-3130
PLANTS in Danville, Illinois, and Hobart, Indiana



... Any way you look at it, Vulcan is your best source for steel pails and drums.

Full open head and closed head pails are available from Vulcan's huge warehousing facilities for prompt shipment in all popular styles from 1 through 15 gallons, whether you need a carton or straight or mixed truckloads or carloads. For protective interior linings, pouring equipment, special container designs or Brand Name lithography ... you can depend on Vulcan to meet your rigid specifications.

Call or write today for test samples and complete information.

over 40 years container experience

VULCAN
CONTAINERS INC.

Bellwood, Illinois (Chicago Suburb)
Phone: Linden 4-5000

In Canada:
Vulcan Containers Ltd., Toronto 15, Ontario

(See "Pails" in Classified Phone Directories)
Representatives in all Principal Cities

AEROSOL P

Interested in explosive aerosol sales records like these set in 1955?

Hair lacquers 53,790,785 **Units per year**

Shaving Lotions 45,387,375 **Units per year**

Insecticides 47,232,131 **Units per year**

Call GENERAL today!

PACKAGING
can be sales dynamite for you!

You've seen it happen with hair lacquers . . . shave creams . . . insecticides. Established or new types of products—*it makes no difference.*

Each year booming aerosol sales hit new highs.

Is *your product* a likely candidate for aerosol packaging?

Yes, if it can be sprayed, brushed on, dusted or daubed. Here's how to make the first move that might lead to an explosive sales boom for you!

Call General Chemical for technical and market advice. No cost or obligation. If your product needs development, we will work with you. Whenever you are ready to market, we will direct you to capable contract fillers who will put up your product in aerosol form for test marketing, as well as handle commercial production afterwards. To arrange for a special presentation on aerosols and the growing aerosol market, write or call "Genetron" Department, General Chemical Division, Allied Chemical & Dye Corporation, 40 Rector Street, New York 6, N. Y.

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The Right Propellant for Every Aerosol Need!

Call on General for:

Free fact-packed technical manuals, market information

A complete aerosol research and development laboratory

Data on many promising new types of aerosols

Field assistance with propellant storage, handling

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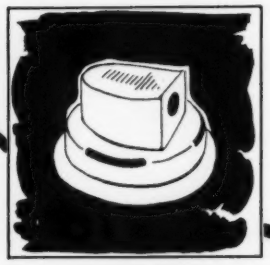
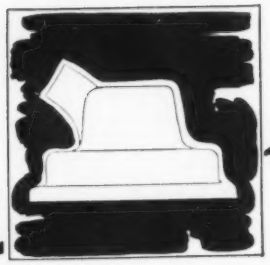
NOW! Pres-O No. 500 Series Valve IN A NEW DESIGN!



with advantages that will help to further your product's popularity



- ✓ ONE VALVE — different buttons to suit *any* product
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- ✓ NEW AND POSITIVE CONTROL of spray direction
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HAIR SPRAY
DEODORANTS
COLOGNES
RESIDUALS
FOAM
THREE-PHASE

PRESSURE FILLING is for the WISE birds!

Pressure filling with Pres-O equipment gives high speed, economical and SAFE loading with *any* type of propellant.

Pres-O equipment is designed and engineered for use with propanes, butanes, alcohol and other combustible materials.

No electrical controls. Air operated. Start and Stop controls are located on *outside* of machine. Handles containers automatically, including crimping and evacuating.

This new Pres-O 500 Series has met acclaim from all who have seen it. *You too,* will see it as an important additional selling point for your product.

All over the world more and still more manufacturers are turning to Pres-O because it offers advantages not found in any other valve.

Write today for full information on

Pres-O: THE BETTER AEROSOL VALVE

OIL EQUIPMENT LABORATORIES, INC.

600 PEARL STREET
ELIZABETH, NEW JERSEY

Containers for Automotive Products

Technical evaluation of metal containers for automotive and other chemical specialty products requires knowledge of formulation to provide the most suitable type package.

By R. G. Nugent and G. E. Curtis
Technical Service Division, American Can Company, Maywood, Illinois

CONTAINERS may be tested and judged on the basis of a number of performance characteristics, and with several objects in mind. These include: (1) evaluation of a new product to determine proper container specifications, (2) evaluation of new containers for old products to permit more economical and more convenient merchandising, and (3) evaluation of container characteristics as a means of quality control. This paper will be confined to the test procedures involved in determining the fitness of a metal container for a product.

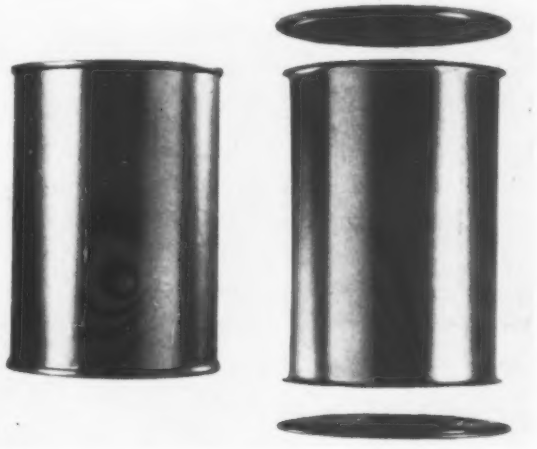
Chemical specialty products are unique from a packaging standpoint in that they may be made in many different ways employing combinations of a myriad of chemicals. The packaging industry had its beginnings with products of fairly constant composition (like peas and lead-in-oil paints), but entered a field of constant product changes when container service to the automotive industry was initiated. It soon became apparent that the end use of a product did not define its composition or make certain the specification for the proper economical container for each brand of the product. Therefore, a program of product and container evaluation for each formulation of each product has proved necessary. It is often said that a new product is the same as some older one – except for a minor change in one component! A minor change in composition frequently has a major effect upon container performance.

The specific reactions of products are not generally predictable from a knowledge of the components. Packaging tests are the proof that is needed. An example of this is provided by the case of one manufacturer who was not satisfied that his product was as good as it could be with regard to container reaction. Accordingly, a corrosion inhibitor was added to the next commercial batch of the product. Examination of storage samples of the new product showed that the corrosion inhibitor apparently had a reverse effect in combination with the other chemicals used in the formulation. Container corrosion with the "inhibited" formula was so severe that the corrosion inhibitor additive had to be deleted from future commercial batches.

Inadvertent minor compositional changes in products may occur coincident with changes in supplies of raw materials. Impurities may be important. Residual chemicals from previous manufacturing operations may be present in raw materials at different levels of concentration; or two different manners of manufacturing the same raw material may result in different impurities being present in the end product. This is sometimes the cause for substantial differences in product and container performances.

Container Materials

The materials that may be used to fabricate metal container parts are not as numerous as the products for which they are made. However, there are plate variables, enamels (both interior and exterior), end sealing compounds, side seam sealants (cement or



Left and right, respectively, assembled and exploded view of three piece sanitary style can.

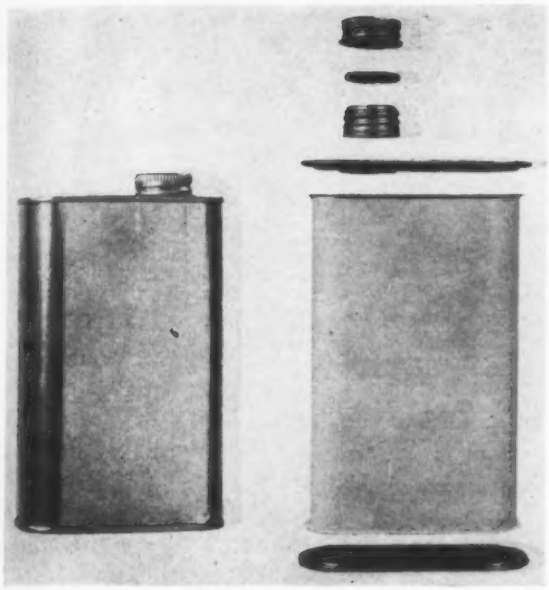
Presented at the 43rd Annual Meeting of the Chemical Specialties Manufacturers Association, Washington, D. C., Dec. 5, 1956.

Does *Your Product* Fit Into This Picture?

Aerosol and pressurized packaging is boosting sales for hundreds of products . . . from insecticides to hair lacquers . . . from perfumes to mothproofers . . . from rug shampoos to hand lotions . . . from deodorants to shaving lathers.

Let us test your product to determine its adaptability to packaging the modern way. We'll do the research in our modern laboratory at no expense or obligation to you. Then we'll sit down with you for a frank discussion of exactly what facilities we have to offer in production, quality control, storage and shipping. Write, wire or 'phone . . . you'll find it worth your while.

PETERSON
Filling and Packaging Co.
HEGELER LANE • DANVILLE, ILLINOIS



Assembled and exploded views (left and right) of seamed top oblong style can. Exploded view shows, from top to bottom, screw cap, cap liner, screw neck, top, body and bottom.

solder) and in the case of cans with screw caps, the cap liners. Each of these components is available in a number of variations to suit each purpose. The plate may be steel, chemically treated steel, tin coated steel in several weights of tin coating, or terne coated steel. The enamels may be phenolics, epons, vinyls, or any one of many common resins used in industrial finishes. Side seam constructions may vary according to the demands of the style container involved and the product requirements. A choice may be made among many available end sealing compounds and cap liners for each product. The choices to be made in attempting to custom fit a commercial container to a new product are best made on the basis of laboratory tests. The container manufacturer should be consulted as to the design of the test program.

After the manufacturer of an automotive product has developed a formulation to the point where it will perform its function best when used by the consumer, it is wise to make extensive container tests to determine the proper container in which to market the product. Usually, the automotive product manufacturer does not have the necessary container variables and he may not have available the particular type of experience needed to make the test and interpret the test results. The container manufacturer can, therefore, be of much assistance in developing suitable container specifications. It should be borne in mind that the tests are mostly shelf life studies. Consequently it may take several months to obtain results sufficiently conclusive to warrant recommendations of a container which will be satisfactory for a normal commercial storage period. Therefore, it behooves the product manufacturer to allow several months between the time the formulation work is completed and the time at which he wishes to market the product.

The container manufacturer is equipped to develop test data and also has the necessary experience to interpret the data and to advise the product manufacturer of any effects of the container on the product or of the product on the container. He can also suggest the container style which would be most satisfactory for the product.

Container Styles

It might be well at this point to describe briefly some of the various types of containers available for the many and varied automotive products. The style to be employed often influences the test procedures. The principal containers are as follows:

1. The round sanitary style container is familiar to everyone. It is mainly used to package food products but variations of it also are used to package products such as oil and antifreeze. Basically, the can is of three-piece construction consisting of a top, cylindrical body,

Assembled (left) and exploded view (right) of Doubletite containers. Shown in exploded view, from top to bottom, are plug, ring, body and bottom.

glass containers move more chemical specialties

Use **Anchorglass®** *containers sealed with* Anchor® *caps*

...because they are chemically inert

GLASS containers are chemically clean and chemically stable. They add nothing, take away nothing from the contents. They prevent evaporation, leakage or absorption of moisture. The purity, strength and other qualities that characterize chemical specialties are protected until the package contents are entirely used. And glass containers invite product inspection, afford a visual inventory, inspire confidence for your product quality. Pack your products in Anchorglass® packages. You will move more of your products by doing so.

ANCHOR HOCKING

GLASS CORPORATION

Lancaster, Ohio

and bottom. Usually, the body and bottom end are assembled at the container manufacturer's plant and an open-top can is shipped to the user. It is then filled and the top is affixed by doubleseaming equipment at the packager's plant.

Sealing compound is lined on the top and bottom ends to provide for a leakproof and permanently sealed container when the doubleseams are formed. In addition, the side seam of the body is soldered. Recently, a construction permitting the elimination of solder from the side seam of cans has been developed. This is the cemented side seam container which, as the name implies, has an organic adhesive material in the side seam to provide a leakproof can.

Cylindrical reclosure cans: "Accu-Por," "Non-Drip" and wide mouth cone top.

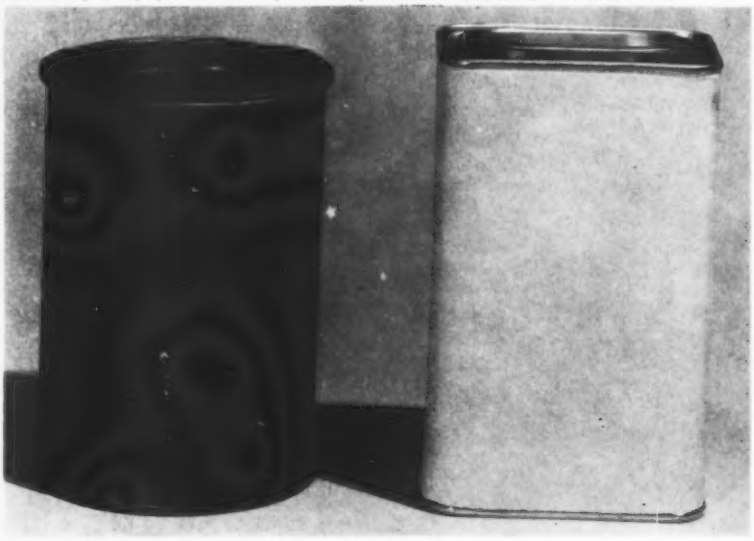
The sanitary style container is employed for products which are to be used completely at one time. It has no reclosure feature. However, it is the most tamperproof and most economical of the metal can styles.

2. A second style of construction is the oblong or so-called "insecticide" style can. This container usually consists of six pieces: an oblong bottom end, a can body, a top, and a screw neck and cap with a cap liner. These cans are available with inside or outside soldered side seams. Most sizes of this type of container are also available with the cemented side seam construction previously mentioned. The cap has a liner which helps to retain the product within the container. This liner usually consists of paperboard faced with organic or metallic types of lining materials, plus a felt backing. It is inserted into the cap by the container manufacturer.

3. The doubletite style container is usually associated with the packaging of paint, but it can be used for a variety of other products, such as auto body solder, paste waxes, and mechanics' hand cleaners. It is a four-piece container consisting of body, bottom, ring, and cover or plug. The plug, when seated, is held in place by a flexing action of the ring and the resultant friction on the plug.

In addition to these three styles, a number of other container variations are used. There are three modifications of cylindrical screw cap reclosure containers. The "Non-Drip" container is made with a plastic nozzle and a plastic cap reclosure feature. Any of the available plates may be used in its manufacture and it may be obtained with the interior of the container fully

Left: an open top grease can; right, a composite fiber and metal container.



A test container opened for examination after storage.

...who has the DARK HORSE in the Aerosol Race

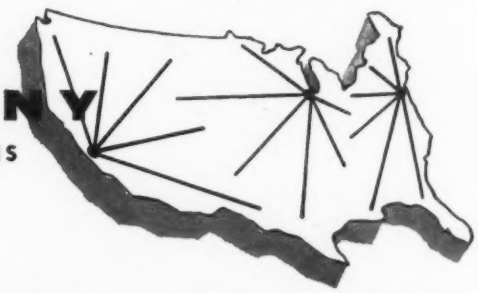
Somewhere in the pharmaceutical, cosmetic, food, chemical or specialty fields today, there are products that are not at all spectacular in their present form or package, but which if packaged as aerosols could become tomorrow's biggest sellers.

You may have such a "dark horse" in your present line.

Today, in G. Barr & Company's laboratories, a continuing, imaginative research program is being carried on to find and perfect these "dark horse" products for tomorrow's markets.

Through constant study of new propellants, new formulations and packaging techniques, we are in a position to offer a unique and comprehensive *Private Label aerosol packaging service*. Through the production of millions upon millions of successfully selling aerosol packages for clients in a wide variety of industries, we have gained experience that has established us as a leader in the pressure packaging field. Yet we market no product of our own.

If you have a product, now being marketed in a standard package, an undeveloped formula, or even the "germ of an idea," we will be pleased to help you ascertain whether it has an aerosol potential.



G. BARR & COMPANY

3601 SO. RACINE AVE., CHICAGO 9, ILLINOIS

PLANTS IN: NEW YORK • CHICAGO • LOS ANGELES

A typical storage rack in a controlled temperature room.

enameled. It has a cemented side seam permitting all-around lithography. A newly developed "Accu-Por" container also is available. It has a drawn, one-piece metal top and nozzle which is closed with a metal screw cap. The side seam is soldered. Another container which has been used for many oil and solvent base products for a number of years is the wide mouth, cone top can.

Some specialty products are best marketed in composite cans which are available in various sizes and shapes. Composite cans are fabricated with metal ends attached to a fiber body. The full open top grease can was designed specifically to hold high viscosity non-liquid products economically, and to provide for easy product removal.

Not pictured, but also used by the automotive industry in lesser quantities, are obround and oval oil cans, single friction closure containers similar to the doubletite can, aerosol cans and flat two-piece fuse boxes.

Choosing a Test Program

The design of a well-rounded container test program deserves very careful consideration. It is the basis on which the merchandiser is going to risk the acceptance of his product in an attempt to bring onto the competitive market a product that will sell—and resell. On the other hand, considerable money can be spent unnecessarily by over-specifying the service requirements of the container, and by purchasing containers fabricated from materials which are more costly than those really needed.

Let us assume that we are designing a test program to determine specifications for the most economical container which would be adequate for a product "X."

Considering the variety of materials from which metal containers can be made, the choice of test variables becomes of prime importance. Plate may be chosen in several tin coating weights, terne coating weights, or uncoated steel to evaluate the performance of each. Choice of plates to be included in the test will depend on prior knowledge of the product composition. Such knowledge also determines whether any or all of the plates should be tested with no enamel coating, or with one or more of the enamel systems commercially available. Governing factors in the selection of test enamels are the pH of the product and the style of can in which the product is to be marketed. Needless to say, anyone would be hard pressed to furnish a satisfactory enameled can for paint and varnish removers. Also there are some limitations of enamel usage because of fabrication requirements in the manufacture of some styles of cans.

In many instances product manufacturers have some idea of the design of container they wish to use. The product and its components should be considered in the light of the construction characteristics of the container style being favored. The experience of the container manufacturer can help avoid many unpleasant commercial experiences because it may be that some designs possess inherent weaknesses when used for the particular product.

When reclosure containers with screw caps are being considered, thought must be given to the types of cap liners to be tested. Many different materials are available commercially for use as cap liners. Generally each container manufacturer standardizes on a few which are representative of the different types. This permits a workable system but still covers the scope of liner characteristics desired. Caps containing each of the regularly stocked liners are used on some of the test cans. A choice of the proper liner for the job can then be made at the completion of the test.

The selection of end sealing compounds for the test entails consideration of many factors, including product resistance, application characteristics in relation to can construction, and the availability of manufacturing equipment. For this reason the matter of sealing compounds is generally left to the container manufacturer and the choice is based on his experience and on confirmation by test results.

After the container variables have been resolved, the next question to be decided concerns the quantity of cans to be tested. Generally, it is desirable to use at least twelve cans per variable. This permits three containers per variable to be examined at each examination and avoids drawing conclu-

(*Turn to Page* 200)

AEROSOL SALES UP 592% IN FIVE YEARS*

*Source: Chemical Specialties Manufacturers Association survey— 1951 through 1955 (last year for which complete figures are available).

LET CONTINENTAL'S EXCLUSIVE LINE OF SIX DOME-TOP AEROSOLS HELP YOU KEEP PACE WITH THIS GROWING MARKET

Looking for the right package to help you ride the trend to bigger aerosol sales? Then take your pick from Continental's exclusive family of six dome-top aerosols—sized from a dainty 3 oz. right up to a whopping 16 oz.

Whatever your product—insecticide, hair spray, air freshener or other—it's sure to stand out in a dome-top lithographed by Continental's master craftsmen. And, because they let you fill all your container needs with one order, Continental dome-tops can trim your shipping and handling costs. Engineering and research services are available, plus contacts with valve suppliers and commercial fillers, if you wish.

Let Continental's line of six dome-top aerosols start selling for you. Along with a full range of sizes, Continental's expanded production facilities now offer rapid delivery from manufacturing points across the U. S. Call soon.

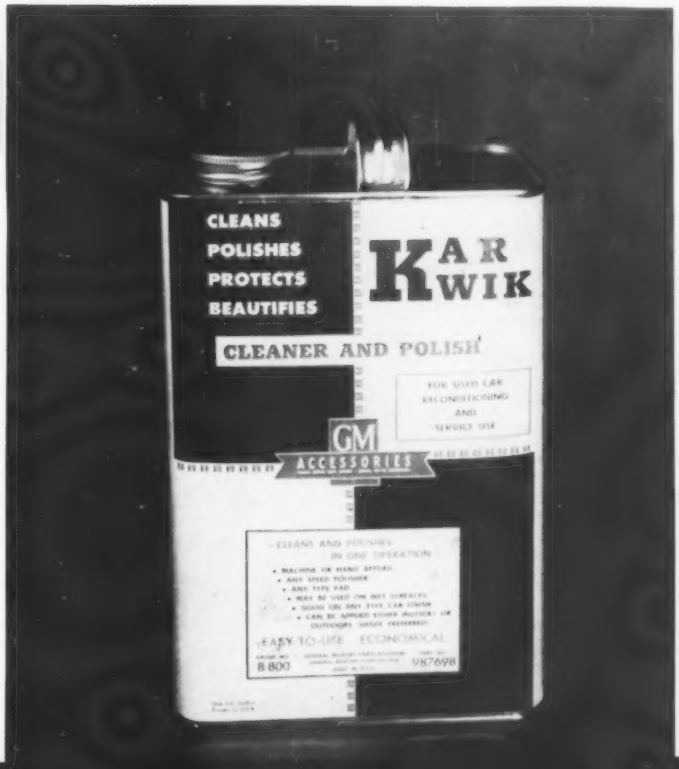
CONTINENTAL CAN COMPANY

Eastern Division: 100 E. 42nd St., New York 17
Central Division: 135 So. La Salle St., Chicago 3
Pacific Division: Russ Building, San Francisco 4

What's New?

New dust-resistant spray that gives lustre to indoor plants is "Antrol Instant Leaf Spray," an aerosol product of Boyle-Midway, Inc., New York. The new spray is said to dry quickly, requiring no wiping or daubing. It can also be used on decorative fruits and vegetables as well as hard-surfaced leaves of house plants. One dozen lithographed cans are packed to a case. Retails at 89c.

"Fyne Suds," light duty liquid detergent for dishes and fine fabrics, was introduced recently by Food Fair Stores, Inc., Philadelphia. A product of Fels & Co., Philadelphia. It comes packed in colorful red, white and blue lithographed American can with blue plastic top. Twelve ounce can retails for 29 cents.



Perfumed solvent type automobile cleaner and polish marketed under the trade name "Kar Kwik" was announced recently by the Chevrolet Motor Division of General Motors Corp., Detroit. Of non-abrasive type, the new cleaner-polish is designed for new acrylic paint finishes. "Kar Kwik" may also be used on older car exteriors. Formulated exclusively for professional application the product may be applied to cars without washing or other preparation, except for removal of heavily caked mud. Solution is squirted on surface with plastic squeeze bottle type dispenser and applied with an electric polisher. Flowery scent was added to make operator's job pleasant.

Its 1957 aerosol line of paint and other consumer products are now packed in 16.4 ounce cans, Plasti-Kote, Inc., Cleveland, has just announced. The new line of spray enamels and lacquers features protective can caps that match color of contents. Detachable spray heads are also new. An improved non-toxic aerosol fire extinguisher, a clear acrylic plastic spray and a new line of aerosol marine lacquers matching enamel colors of leading outboard motor, tractor and implement manufacturers are innovations of this year's Plasti-Kote line. The new marine lacquers are packed in 12 ounce containers only. Plastic spray, fire extinguisher and aerosol paint line retail for $1.89.

Ty·D·bol
KEEPS TOILET BOWLS SPOTLESS • NO STAIN NO RING
JUST HANG IN THE TANK
Ty·D·bol TOILET CLEANER
FLUSHING DOES IT!
KEEPS TOILETS CLEAN Automatically
DEODORIZES · SANITIZES

New display unit for "Ty-D-Bol" toilet bowl detergent and room deodorant made by Tidy Chemical Co., Sunnyvale, Calif. Bottle, by Hazel-Atlas Division of Continental Can Co., New York, is especially designed to be placed neck down for dispensing of product in toilet flush tank. An indentation in bottom of bottle holds metal arm that permits hanging in "bottoms-up" position for product release. Dispenser in bottle neck meters out precise amount of product each time tank refills, thus keeping toilets clean automatically. Product is distributed through supermarkets and chain store outlets on Pacific Coast and in Rocky Mountain areas with national distribution planned.

Now available in 16 ounce metal end cardboard container is "Dri-Z-All," absorbent and deodorant of Dri-Z-All Division of Diamond Head Oil Refining Co., Kearny, N. J. Designed to remove oil and grease from any type floor, absorb moisture, prevent slipping on icy pavements, "Dri-Z-All" is claimed to be non-combustible and non-toxic.

Twin aerosol cleaning aids bowed early this month under the "O-Cedar" label of O-Cedar Division of American-Marietta Co., Chicago. Newly acquired "Endust," dust mop and dust cloth spray, and "Sea-Spray," oven cleaner, go into full-scale national distribution. "Endust" retails for 98 cents in six ounce can and $1.79 in 12 ounce size. "Sea-Spray" is priced at 98 cents for six ounce size and $1.49 for 12-ounce can. Containers are Crown Can Co.'s "Spra-Tainers."

The emphasis is on safety, ease and pleasantness of use in new "Airkem" bowl cleaner, just announced by Airkem, Inc., New York. Designed to eliminate one of the major rest room odors by dissolving unsightly urine salt incrustations, it combines the controlled sudsing action of a detergent, plus the scale and rust removing action of a controlled acid. Product is said not to harm porcelain fixtures, metal pipes or plumbing, septic tanks or bacterial fermentations in the system. Available in pints, quarts and gallons, a disposable acetate swab is packed with each bottle.

Growing consumer preference for large or king-size packages for reasons both of economy and convenience is reflected by this giant 48- oz. decanter bottle recently introduced by Mary Sherman, Inc., St. Louis 18, Mo., for packaging the company's "Mary Sherman" perfumed bubbling bath oil. Decorative as well as functional, this private mold decanter has blown-in swirl design which also provides an easy-gripping feature for feminine hands. Wide base and low center of gravity afford protection against tipping.

First introduced in 1949, "Mary Sherman" bubbling bath oil is packed in 8-oz., 16-oz. and 32-oz. bottles, and now in new 48-oz. decanter. Decanter and reverse taper molded closure by Owens-Illinois Glass Co., Toledo; foil label by St. Louis Sticker & Label Co., St. Louis. Individual carton is produced by Artcraft Paper Box Co., St. Louis.

New concentrated liquid detergent for hand dishwashing was announced recently by Nyco Products Co., Chicago. Trade named "Swel," the detergent which may be used for washing in hot or cold water, comes packaged in one gallon glass bottles. A plastic dispenser comes free with each four gallon order. The dispenser delivers one ounce of detergent with each plunge. Product also includes a water softening agent. Dishes and glass washed with "Swel" need not be towel dried.

Packaging NOTES

Vulcan Names Two

Fred A. Kusta has been named general plant manager and John Carson, superintendent of

F. A. Kusta

J. Carson

Vulcan Steel Container Co., Birmingham, Ala., it was announced recently by Gordon D. Zuck, president.

Mr. Kusta formerly held a similar position with Inland Steel Container Co., Cleveland. He previously has been associated with Cleveland Steel Barrel Co. In his new post, Mr. Kusta will be responsible for all pail and drum manufacturing at the company's main plant in Birmingham.

Mr. Carson previously was associated with Inland, Cleveland Steel Barrel and Fram Corp.

Vulcan manufactures steel pails and drums in sizes from one through 20-gallons for chemical, paint and petroleum products.

—★—

Packaging Machinery Show

"How To Do It" will be the theme of the 19th annual Packaging Machinery & Materials Exposition to be held at Convention Hall, Atlantic City, March 25-28, 1958. The show will be sponsored by the Packaging Machinery Manufacturers Institute.

The more than 6,000 square feet of exhibit space will feature active demonstrations and displays of the latest packaging machinery and materials. The exhibits will be manned by technicians who will be able to answer customers' questions about new equipment, new materials and new packaging techniques.

In addition, the 1958 exposition will include a series of educational sessions on machinery and materials research and development and production line techniques.

—★—

Gair Names Beilein

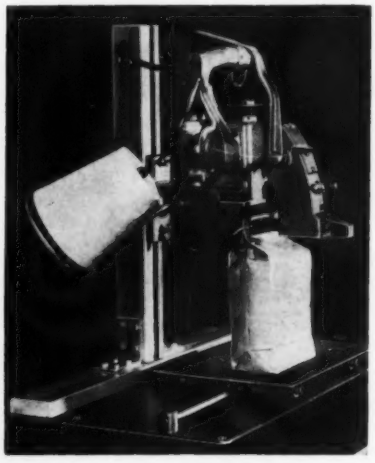
Arthur J. Beilein has been appointed superintendent of finishing operations of the Tonawanda boxboard mill of Robert Gair Division of Continental Can Co., New York, it was announced recently by William H. Caddoo, vice-president in charge of boxboard operations. Mr. Beilein, who was formerly personnel manager at Tonawanda, joined Gair in 1936. He was appointed supervisor of the receiving department in 1944 and personnel manager in 1952.

—★—

New "Bell-Pak" Filler

A new bulletin, describing its new high-speed "Bell-Pak" filling machine, was announced recently by Bell Machine Co., Oshkosh, Wisc. The bulletin gives basic information, illustrations, specifications and construction details of the machine which is designed to package solids, liquids, powders or semi-solids. The new unit, which is said to fit into any type of production line, can be utilized to fill different size containers simultaneously at speeds up to 400 per minute. Copies of the bulletin are available on request to the company.

New Bell bag filling machine.



—★—

Continental Elects Dyke

The election of George E. Dyke, formerly chairman of the board and president of Robert Gair

George E. Dyke

Co., New York, as vice-chairman of the board of Continental Can Co., New York, was announced recently by Lucius D. Clay, Continental chairman. Mr. Dyke had been chairman of the board of Gair since 1940 and president since 1939. He had joined Gair in 1939 as executive vice-president and director.

At the same time, Gen. Clay announced the election of three new Continental vice-presidents: Raymond F. DeVoe and Norman F. Greenway, former senior vice-presidents of Gair; and Robert L. Fitts, previously a Gair vice-president. Mr. DeVoe joined Gair in 1947 after having served for five years as its financial consultant. He became a vice-president in 1948, and a senior vice-president in 1952. Mr. Greenway joined Gair in 1934, became a vice-president in 1939 and later director and senior vice-president. Mr. Fitts was president of the Southern Advance Paper & Bag Co., Boston, until 1955 when he joined Gair as a vice-president and director.

Continental also announced that an initial dividend of $1.12½ per share on its new second preferred stock, was payable Dec. 31,

to stockholders of record Dec. 7. The new stock pays dividends at the rate of $4.50 per year on a quarterly basis and is the result of an exchange for the preferred stock of Robert Gair Co., which paid the same dividend. Gair was merged into Continental on Oct. 26.

—★—

G. C. Noblit Retires

G. C. Noblit, purchasing director of Brockway Glass Co., Brockway, Pa., has retired after 23 years in the glass container field, it was announced recently by Finley B. Hess, executive vice-president. Mr. Noblit joined Brockway in 1933 as sales manager of the fruit jar division. A year later he was named purchasing agent and placed in charge of that department. He was appointed purchasing director in 1955.

—★—

Fiberglass Names P&G Exec.

Howard J. Morgens, executive vice-president of Procter & Gamble Co., Cincinnati, has been elected to the board of directors of Owens-Corning Fiberglass Corp., Toledo, it was announced recently. Mr. Morgens joined Procter & Gamble in 1933. He was named advertising manager in 1946 and two years later became vice-president in charge of advertising. In 1950, Mr. Morgens was elected a director of P&G and in 1954 was named vice-president in charge of the firm's operations in the United States.

HOWARD J. MORGENS

Bracon . . . SQUEEZE-TO-USE PACKAGING

Caught in a Squeeze?

Just supposing you were caught on evening KP. You would be discovering that GLIM, all-purpose liquid detergent packed in a squeeze can, made dishwashing and other household cleaning easier than ever before. Convenient? A gentle squeeze to the pliable polyethylene puts just the right amount of liquid GLIM where you want it . . . no measuring—no pouring—no caps to fuss with.

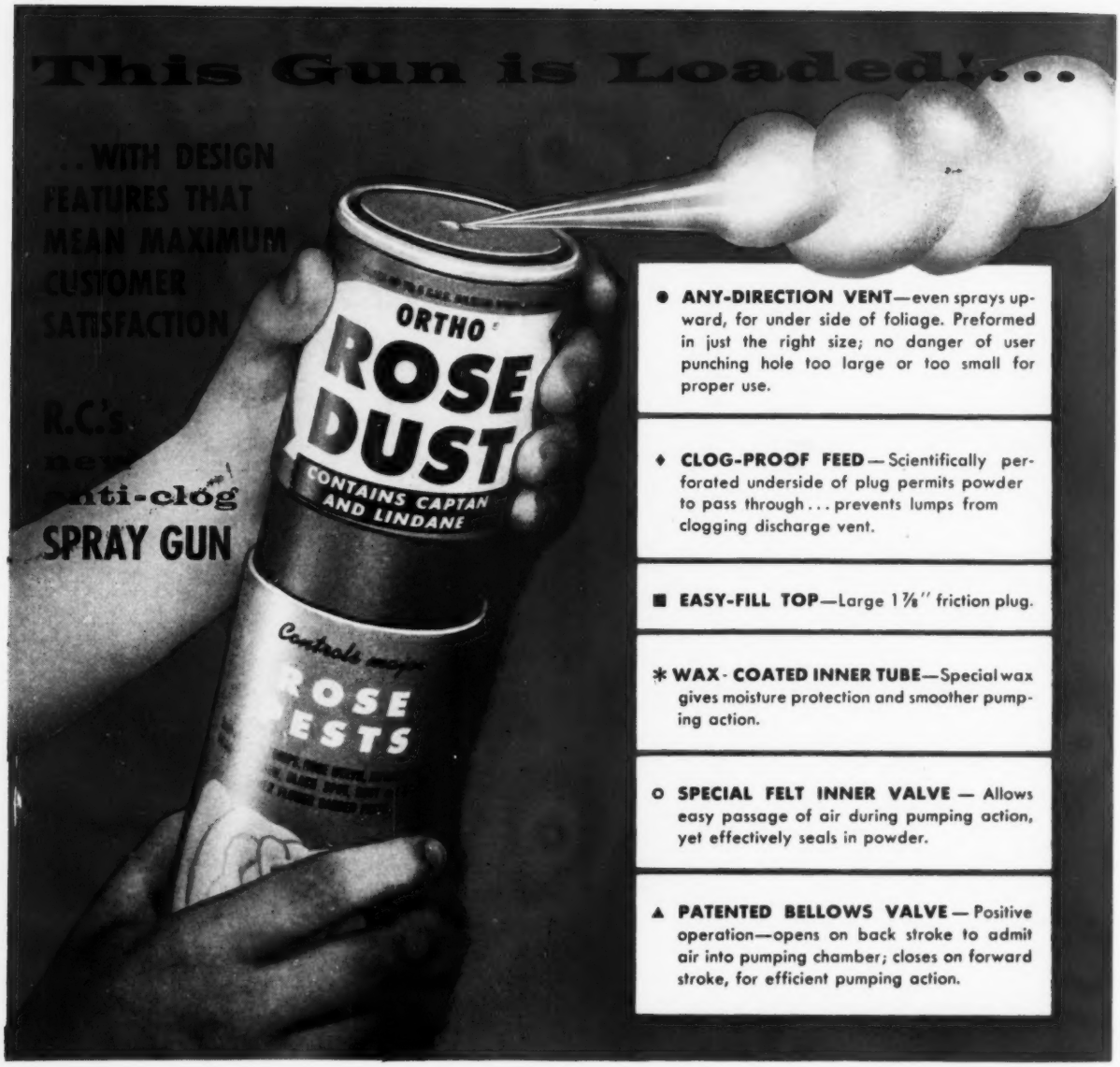
GLIM is now underway with total conversion to the BRACON 2ME* squeeze can. Starting in selective markets a few months ago, B. T. Babbitt found more women expressed preference for the squeeze can. Grocers responded to their stackability, quick turnover and merchandising appeal. High speed filling and shipping economies (they're lighter) help to keep GLIM's prices competitive.

If you have a merchandising problem that could stand a packaging pick-up, don't wait for the squeeze. Let us show you what a BRACON squeeze-to-use can, tube, or bottle could do for you. Write for details.

* World wide patents, exclusive manufacturers.

BRADLEY CONTAINER CORPORATION

Maynard, Mass. — *New York, Chicago, Los Angeles, Toronto*


This Gun is Loaded!...
...WITH DESIGN FEATURES THAT MEAN MAXIMUM CUSTOMER SATISFACTION
R.C.'s
ti-clog
SPRAY GUN
ORTHO
ROSE DUST
CONTAINS CAPTAN AND LINDANE
Controls major
ROSE PESTS
● ANY-DIRECTION VENT—even sprays upward, for under side of foliage. Preformed in just the right size; no danger of user punching hole too large or too small for proper use.
♦ CLOG-PROOF FEED—Scientifically perforated underside of plug permits powder to pass through... prevents lumps from clogging discharge vent.
■ EASY-FILL TOP—Large 1 7/8" friction plug.
✱ WAX-COATED INNER TUBE—Special wax gives moisture protection and smoother pumping action.
○ SPECIAL FELT INNER VALVE — Allows easy passage of air during pumping action, yet effectively seals in powder.
▲ PATENTED BELLOWS VALVE — Positive operation—opens on back stroke to admit air into pumping chamber; closes on forward stroke, for efficient pumping action.

..and for added ammunition..these COMPANION PACKAGES by R. C.

For refill, or for related use, R. C. Cans offer many extra features: paraffin coating, special moisture proof laminations, and a wide variety of tops (with or without identations for sifting).

R C CAN COMPANY

R. C. CAN CO. The Stamp of Quality ST. LOUIS, MO.

MAIN OFFICE and Factory **9430 Page Blvd., St. Louis 14, Mo.**

Branch Factories: **Arlington, Tex.; Rittman, O.; Turner, Kans.**

W. L. BENNETT, 126 S. Third St., Minneapolis 1, Minnesota • CAN SUPPLY COMPANY, 1006 W. Washington Blvd., Los Angeles 15, California C. E. DOBSON, 1003 Carondelet Bldg., New Orleans 12, Louisiana • L. C. MORRIS CO., P. O. Box 8042 Station F, 1156 Dalon Drive, N. E., Atlanta 6, Georgia • S. W. SCOTT & SON, 608 McCall Bldg., Memphis 3, Tennessee • R. C. CAN COMPANY, 225 W. 34th Street, New York City, N. Y. PALMER SURPLIES CO., OF FLORIDA, Palmer Building, 209-211 E. Robinson, Orlando, Florida • JOE ROVIN, c/o Chicago Transparent Bag Co., 4806 W. Chicago Ave., Chicago 51, Illinois.

NEW Trade Marks

THE following trade marks were published in recent issues of the *Official Gazette* of the U. S. Patent Office in compliance with section 12 (a) of the Trade Mark Act of 1946. Notice of opposition under section 13 may be filed within 30 days of publication in the Gazette. See rules 20.1 to 20.5. As provided by section 31 of the Act, a fee of $25 must accompany notice of opposition.

Duet—This for floor wax and cleaner. Filed May 24, 1956 by Simoniz Co., Chicago. Claims use since Nov. 9, 1954.

Pine King—This for aerosol insecticide and aerosol deodorant. Filed Nov. 12, 1954 by Connecticut Chemical Research Corp., Bridgeport, Conn. Claims use since June 1948.

Moth Chek—This for mothproofing chemicals. Filed Sept. 26, 1955 by Chek Chemical Products Co., Newark, N. J. Claims use since Nov. 29, 1946.

Paradize—This for insecticides and mothicides consisting of paradichlorobenzene. Filed Oct. 24, 1955 by Paradize Chemical Co., New York. Claims use since Jan. 1949.

Heliogen—This for disinfectant. Filed June 6, 1956 by Heliogen Products, Inc., Long Island City, N. Y. Claims use since March 29, 1956.

Sponto—This for surface active agents for use in detergents, etc. Filed June 15, 1956 by Retzloff Chemical Co., Alameda, Tex., Claims use since May 1, 1954.

Hyagen—This for combined wetting and sanitizing agent. Filed June 18, 1956 by Miami Products & Chemical Co., Dayton, O. Claims use since May 1, 1946.

Quickleen—This for furniture, automobile and hardwood floor polish. Filed May 31, 1956 by Finishine Laboratories, Inc., Syracuse, N. Y. Claims use since Dec. 1932.

Allegro—This for furniture polish. Filed June 5, 1956 by Gauff Corp., New York. Claims use since May 1, 1956.

The Maid in a Bottle—This for plastic starch, pine oil disinfectant, foaming action bleach, laundry starch and transparent starch. Filed Jan. 3, 1956 by Texize Chemicals, Inc., Greenville, S. C. Claims use since Oct. 1948.

Onex—This for rat and mouse killer bait. Filed April 17, 1956 by Hydroponic Chemical Co., Copley, O. Claims use since March 22, 1956.

Birko—This for detergents. Filed May 9, 1955 by Birkenwald, Inc., Seattle, Wash. Claims use since Jan. 1, 1955.

Jet-Fast—This for compounds and liquids for cleaning white wall tires, for washing automobiles and car bodies. Filed Oct. 17, 1955 by Norman Wiggs, doing business as Norman Wiggs & Co., Los Angeles, Calif. Claims use since Feb. 10, 1954.

Texize—This for dishwashing detergent, floor cleaner, household and rug cleaner. Filed Jan. 3, 1956 by Texize Chemicals, Inc., Greenville, S. C., Claims use since Jan. 1947.

Lanair—This for toilet soap. Filed Jan. 19, 1956 by Lanair Co., Chicago. Claims use since in or about Jan. 1951. Subject to interference with SN 688,903.

Legstrip—This for floor cleaning compound. Filed Feb. 29, 1956 by Walter G. Legge Co., New York. Claims use since Feb. 2, 1956.

Zip Quick—This for spot remover. Filed April 6, 1956 by Con L. Cole, doing business as Zip-Quick Products, Rockmart, Ga. Claims use since March 9, 1956.

Climax—This for rug cleaning compound. Filed April 20, 1956 by Climax Industries, Cleveland, O. Claims use since April 2, 1956.

Permacel—This for prepaint cleaners; wax, silicone and oil removers and degreasers. Filed April 20, 1956 by Permacel Tape Corp., New Brunswick, N. J. Claims use since Feb. 28, 1956.

Perf—This for detergent powder or crystals. Filed May 9, 1956 by Ralph Bank, doing business as Marlotte Products Co., Brooklyn, N. Y. Claims use since March 19, 1956.

Tra-La—This for sudsing cleaner, cleanser, and detergent. Filed May 29, 1956 by Colgate-Palmolive Co., New York. Claims use since Feb. 15, 1956.

Sili-Garde—This for shampoo. Filed June 4, 1956 by Richard Hudnut, New York. Claims use since May 10, 1956.

Extermo—This for insecticide cones. Filed Sept. 23, 1955 by Avon-Strand, Inc., Chicago. Claims use since June 1, 1955. Subject to interference with SN 696,741.

Extermo—This for insecticides. Filed Oct. 19, 1955 by Rochester Germicide Co., Rochester, N. Y. Claims use since Jan. 1895. Subject to interference with SN 695,205.

Glade—This for household deodorant. Filed June 18, 1956 by S. C. Johnson & Son, Inc., Racine, Wis. Claims use since March 18, 1956.

Deskare—This for cleaning agent for linoleum and plastic desk tops. Filed Dec. 5, 1955 by William L. Drommer, doing business as Office Aids Co., Sioux City, Ia. Claims use since Aug. 2, 1954.

Jon-Wax—This for auto paste wax having cleaning characteristics. Filed April 27, 1956 by S. C. Johnson & Son, Inc., Racine, Wis., Claims use since March 28, 1955.

Keithone—This for chemically impregnated general purpose cleaning cloths. Filed June 7, 1956 by Walling Keith, doing business as Keith Chemical Co., Birmingham, Ala. Claims use since Dec. 1955.

Gregg-Pel—This for non-durable type water repellent finish for textiles. Filed March 16, 1956, by McCampbell & Co., New York. Claims use since March 4, 1953.

Chlori-Sept—This for chemical disinfectants and sanitizers in tablet form. Filed April 3, 1956 by John F. Hancock & Son, Inc., doing business as Chlori-Sept Co., a division of John F. Hancock & Son, Inc., Baltimore, Md. Claims use since Oct. 21, 1955.

Micronized—This for insecticides and fungicides. Filed Oct. 2, 1956 by Pittsburgh Plate Glass Co., Pittsburgh, Pa. Claims use since Feb. 17, 1937.

Vita-Kleen—This for all purpose detergent type cleaner for household and automobile use, adapted for use on rugs, upholstery, walls and finishes. Filed April 28, 1955 by Hennepin Products Co., Minneapolis. Claims use since on or about April 4, 1955.

Jasco—This for paint-brush cleaner; glass cleaner; rug and upholstery shampoo; grease remover; hand cleaner; paint, wax and polish remover; pine oil base detergent cleaner; and automobile cleaner. Filed June 6, 1955 by Jay S. Conley, doing business as Jay S. Conley & Co., Mountain View, Calif. Claims use since July 15, 1947.

Chlorinol—This for bleaching cleansing, and disinfecting agent for use in a cleanser. Filed Nov. 23, 1955 by Procter & Gamble Co., Cincinnati. Claims use since Oct. 12, 1955.

Exavon—This for textile detergents and scouring agents. Filed Dec. 27, 1955 by Soluol Chemical Co., Natick, R. I. Claims use since on or about July 2, 1947.

Travelav—This for liquid soap composition. Filed May 16, 1956 by Haviland Laboratories, Inc., doing business as Ann Haviland, New York. Claims use since April 30, 1956.

Halyard—This for toilet soap and shaving cream. Filed June 8, 1956 by Houbigant, Inc., New York. Claims use since June 1, 1956.

Tepid and Rhyme—Each for general purpose detergents. Filed June 11, 1956 by Monsanto Chemical Co., St. Louis, Mo. Claims use since June 1, 1956.

Style—This for floor finishes for asphalt, linoleum, rubber, and vinyl tile floors. Filed May 10, 1956 by Vestal Laboratories, Inc., St. Louis, Mo. Claims use since April 16, 1956.

Kilt—This for floor wax. Filed June 15, 1956 by Bonnie Brite Products Corp., New York. Claims use since May 21, 1956.

Diben—This for insecticide, specifically against lawn pests. Filed March 22, 1956 by Wilson & Toomer Fertilizer Co., Jacksonville, Fla. Claims use since June 30, 1955.

Liquid-Lite—This for laundry whitening and brightening agent. Filed June 29, 1956 by Miko Chemical & Research Co., Glenshaw, Pa. Claims use since June 28, 1955.

Sentry—This for dentifrice. Filed Aug. 26, 1955 by Bristol-Myers Co., New York. Claims use since Oct. 18, 1954.

Iopipe—This for liquid germicide cleaner for dairy use. Filed March 7, 1956 by Lazarus Laboratories, Inc., a division of West Disinfecting Co., Buffalo, N. Y. Claims use since Nov. 17, 1955.

Pomp and Circumstance—This for soap, shampoo and lather shaving cream. Filed June 19, 1956 by Colgate-Palmolive Co., New York. Claims use since Nov. 22, 1955.

Gah-Zel—This for liquid, all-purpose, soapless, non-flammable cleaner. Filed June 22, 1956 by Approved Products, Inc., Memphis, Tenn.

(*Turn to Page* 211)

Microscopic examination for structure of plastic components after exposure to aerosol formulation

"Known throughout the World"

IMITATED...BUT NEVER DUPLICATED—

THE *Precision Valve*

From planning to commercial production, a new aerosol product requires infinite knowledge, effort and research. Almost every phase of human endeavor contributes its share to the completed product.

The final use, however, is dependent upon the proper valve, which is carefully designed, engineered, and manufactured to produce the proper dispersion of spray, mist or foam.

We at Precision are ready to help you, whether it be formula, package design, or production. Our facilities can be our contribution to the success of your business.

Whether it be a million and ten **or just ten**... Precision has or will develop the aerosol valve for your product. Our large quality control department assures you of the finest results along with the economy required for profitable sales.

PRECISION

Precision Valve Corporation

700 NEPPERHAN AVENUE • YONKERS 3, NEW YORK

PRESSURE PACKAGING

New Gard Aerosol Division

Formation of a new aerosol custom filling division was announced recently by Gard Industries, Wilmette, Ill. The announcement was made by Howard G. Klehm, president. The new division will handle both solvent and water base products in a variety of forms, including spray, foam or powder. Gard, the first producer of over-the-counter aerosol pharmaceuticals, also manufactures its own line of aerosol products.

Howard G. Klehm, President

J. Jago, gen. mgr. Custom Filling Div.

Lee Dick, mgr. Marketing & Merchandising

Although Gard's new filling division is contained in the parent corporation it is geared to act independently of Gard's regular operation. In addition to handling the filling of the complete Gard line, which includes insect repellent, insecticide, "K-T" foot spray, suede conditioner, anti-rust spray, moth-proofer, room deodorant and weatherproof spray, the new division already has major filling accounts in the paint, drug and cosmetics fields.

Gard claims to be the first company to employ high speed pressure filling, the first to fill products that could not be refrigerated, and the first to manufacture a pharmaceutical approved for non-prescription sale.

The firm will also offer marketing advice and assistance. It can handle production runs of from 100 to one million cans.

Technical or manufacturing assistance and complete information is available upon written request to Gard Industries, Inc., Contract Filling Division, 733 Green Bay Road, Wilmette, Ill.

★

New Pennsalt Plant

Completion of construction of a new plant to manufacture "Isotrons," a new line of aerosol propellants and refrigerant gases was announced recently by Pennsylvania Salt Manufacturing Co., Philadelphia.

The new facilities at Pennsalt's Calvert City, Ky., works will be augmented by a second Calvert City "Isotron" plant now under construction and scheduled for completion later this year, according to William P. Drake, president. Features of the new plant include vapor phase catalytic converters and distillation and drying systems.

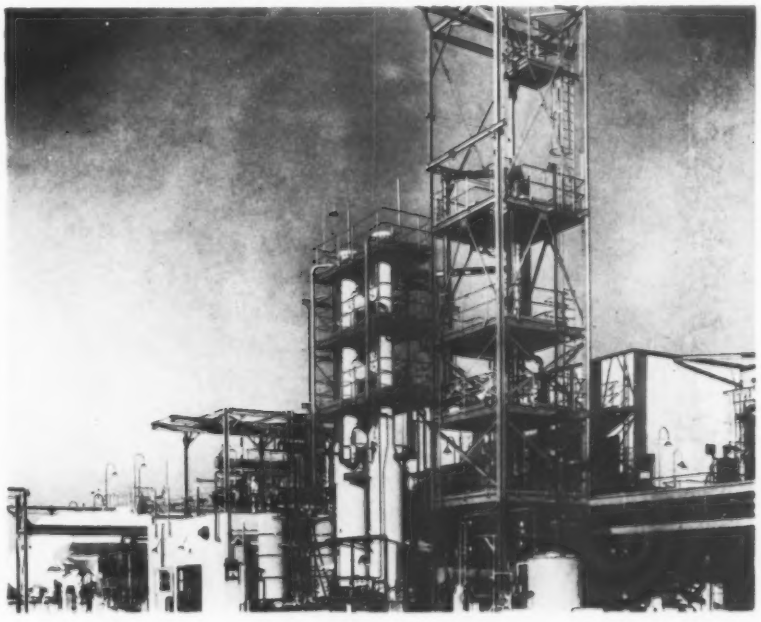
A nationwide marketing team of Pennsalt salesmen and manufacturer's agents recently was organized to handle sales of the product. The team will service contract and private label aerosol fillers and equipment manufacturers.

★

Pittorie Joins ATI

M. Pittorie has joined Aerosol Techniques, Inc., Bridgeport, Conn., as package designer, it was announced recently by H. R. Shepherd, president. In his new assignment, Mr. Pittorie will serve as a technical consultant on aerosol contract packaging projects and will provide a complete private label package design service for firms not equipped with their own

New Calvert City, Ky., "Isotron" aerosol propellant plant of Pennsylvania Salt Manufacturing Co., Philadelphia, which is now in production.

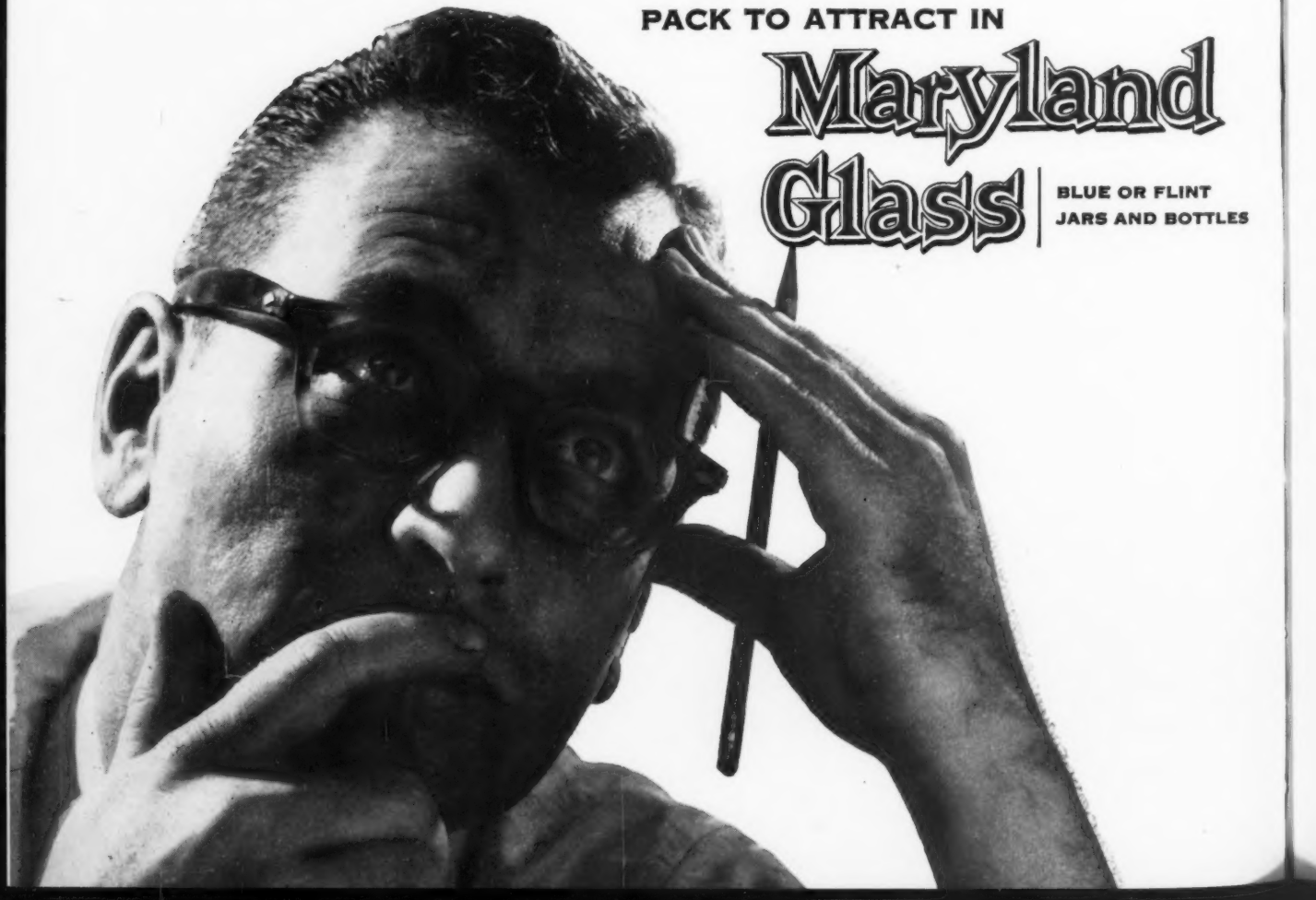


Imagination

AN INTEGRAL PART OF THE CONTAINER WHEN MARYLAND GLASS TAKES OVER YOUR DESIGN PROBLEM!

When you drop a packaging problem in our lap, the end result is more than a glass container. It is an *idea* . . . born of restless imagination, shaped by skilled hands, backed by years of sound experience. Our creative staff gives you a selling package that packs well, ships well and pushes your product on the shelf. For a successful solution to your design problem, contact MARYLAND GLASS CORPORATION, 2147-53 Wicomico St., Baltimore 30, Md.

STOCK DESIGNS
—A variety in blue or flint glass and a complete range of sizes is ready for immediate shipment.



PACK TO ATTRACT IN

Maryland Glass

BLUE OR FLINT JARS AND BOTTLES

design facilities. Aerosol Techniques is manufacturer of refrigerated and pressure-filled units in metal containers, glass bottles and plastic containers.

—★—

Airosol Expands

Airosol, Inc., Neodesha, Kans., recently announced a 7,000 square foot addition to its manufacturing facilities in that city. According to John Matthews, Airosol owner, the expansion will increase plant production to 50,000 Airosol insecticide aerosols per day. The company also produces aerosol room deodorants and paints.

—★—

du Pont Reassigns Two

Robert Wright, Jr., and John H. Grant have been named technical sales representative and sales correspondent, respectively, for Kinetic Chemicals Division of E. I. du Pont de Nemours, Inc., Wilmington, Del., it was announced recently.

Mr. Wright will represent "Freon" aerosol propellants in St. Louis. He replaces Thomas J. Amann, who recently resigned to enter private business. Mr. Wright joined du Pont in 1947 as a chemical supervisor at its Grasselli, N. J., plant. He later served in various engineering capacities at the company's atomic energy division in Wilmington. He joined the Kinetic Division last April as a sales trainee.

Mr. Grant, who will headquarter at the firm's New York office, joined du Pont as a methods and standards engineer in 1950. Since that time, he has served with the control division of the organic chemicals department in Wilmington and at Deepwater, N. J.

Bottles in a wide range of shapes and colors for packaging aerosol products are now possible through the use of a new type of "Zytel" nylon resin developed by E. I. du Pont de Nemours & Co., Wilmington. The new nylon formulation is especially suited for blow-molding of bottles. This type fabrication results in extremely durable one-piece aerosol package in variety of shapes with molded-in color.

—★—

Associated Brands to Move

Associated Brands, Inc., Brooklyn, N. Y., custom aerosol loader, has purchased a new plant at 50 Wallabout St., Brooklyn, it was announced recently by H. Bruce Hagler, president. The company will move to its new headquarters in early spring. Associated is now located at 35 Claver Place.

The new plant contains 100,000 square feet of floor space and is equipped with three complete twin automatic aerosol lines for both cold and pressure filling, a de-ionized water unit, and storage tanks of 40,000 gallon capacity. All equipment is of stainless steel. The plant also includes three automatic packaging lines for liquids, semi-solids and non-aerosol solids.

New plant of Associated Brands, Inc., Brooklyn, aerosol loader, which was announced recently by H. Bruce Hagler, president.

★

New "Wiff" Formula

Jasgo Chemical Co., 1128 St. Johns Place, Brooklyn, N. Y., recently announced a new formula for its "Wiff" aerosol insecticide. Called J-123, the new formula is compounded of pyrethrum and

piperonyl butoxide, and is claimed to be non-irritating, non-toxic and non-flammable. "Wiff" is manufactured in a five-pound aerosol bomb and is designed for use against flies, mosquitos, roaches and moths.

—★—

Crown Relocates in Dallas

The Dallas, Tex., branch of Crown Cork & Seal, Inc., Baltimore, has occupied its newly-constructed warehouse and district sales offices at 123 Oaklawn Ave., it was announced recently by W. I. Lang, district sales manager of the firm's Crown and Closure division. Both warehouse and office facilities previously had been maintained at 917 Marion St., Dallas.

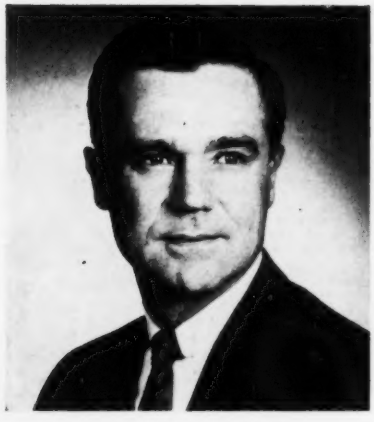
The new 30,000 square foot building will also serve as a warehouse for products formerly stored at the division's Houston, Tex., warehouse, which was closed last month. Facilities include two dock openings; a rail siding; a covered truck well with a dock leveler; and a small platform to accommodate pick-up trucks.

—★—

Bradley in New Post

Robert D. Bradley has been appointed sales manager of Oil Equipment Laboratories, Inc., Elizabeth, N. J., it was announced recently. In his new post, Mr. Bradley will supervise sales of aerosol valves and aerosol filling equipment. Prior to joining Oil Equipment, Mr. Bradley served for nine years with Johnson & Johnson, New Brunswick, N. J.

ROBERT D. BRADLEY



Gregory to Newman-Green

Joseph Gregory has joined Newman-Green, Inc., Addison, Ill.,

JOSEPH GREGORY

as sales manager, it was announced recently. For the past four years, Mr. Gregory was associated with Chase Products Co., Maywood, Ill., where he was in charge of the aerosol custom filling division. Prior to joining Chase, Mr. Gregory served as production manager of aerosol products for Aeropak, Inc., Chicago, and in the research department of Continental Can Co., New York.

—★—

VCA Moves N. Y. Office

VCA, Inc., Bridgeport, Conn., aerosol valve producer, has moved its New York office to 10 East 49th Street, it was announced early this month by Sig Was, director of sales. The telephone number remains unchanged: PLaza 9-7950. The firm's New York office was previously located at 630 Fifth Avenue.

—★—

New Paint Aerosol Can

Plasti-Kote, Inc., Cleveland, recently announced that its 1957 line of aerosol paint sprays will be available in a new 16-ounce container. The can features a protective cap, matching the color of the contents, and a detachable all metal spray head, which is claimed to prevent clogging. Plasti-Kote enamels and lacquers will be offered for the first time in chevron blue, swift red, rose pink and chartreuse in the 16-ounce cans. Other products to be featured in the new containers are a non-toxic aerosol fire extinguisher and a clear acrylic plastic spray.

—★—

KAP Elects Stolk

William C. Stolk, president of American Can Co., New York, has been elected chairman of the board of trustees of Keep America Beautiful, Inc., New York, at the organization's third annual meeting held last month at the Hotel Biltmore, New York.

Other officers elected include Smith L. Rairdin, Owens-Illinois Glass Co., Toledo, chairman of the board of directors; P. P. Wojtul, Continental Can Co., vice-president; and Donald J. Hardenbrook, Union Bag-Camp Paper Corp., New York, president. Elected to the board of directors was Harvey C. Knowles, Procter & Gamble Co., Cincinnati, while John M. Olin, Olin Mathieson Chemical Corp., was named to the board of trustees.

—★—

SCC Names Root

Morris J. Root, technical director of G. Barr and Co., Chicago, custom aerosol loader, has been named national membership chairman of the Society of Cosmetic Chemists, it was announced recently by Sabbat J. Strianse, president, and director of research of Shulton, Inc., Clifton, N. J. Mr. Root will be responsible for membership recruitment programs and approval of membership applications. He will serve for a two year term.

MORRIS ROOT

Production...

EQUIPMENT · MATERIALS · PROCESSING

Production Clinic

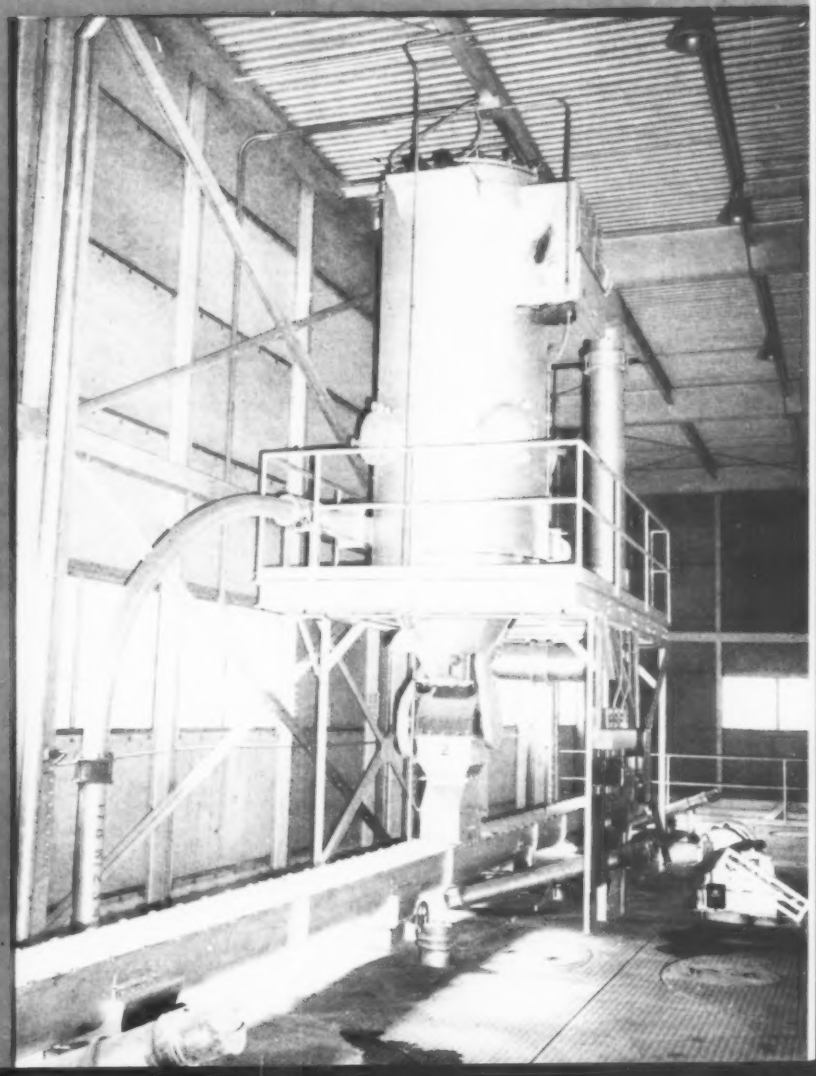
Soap Plant Observer

Products and Processes

New Patents

Book Reviews

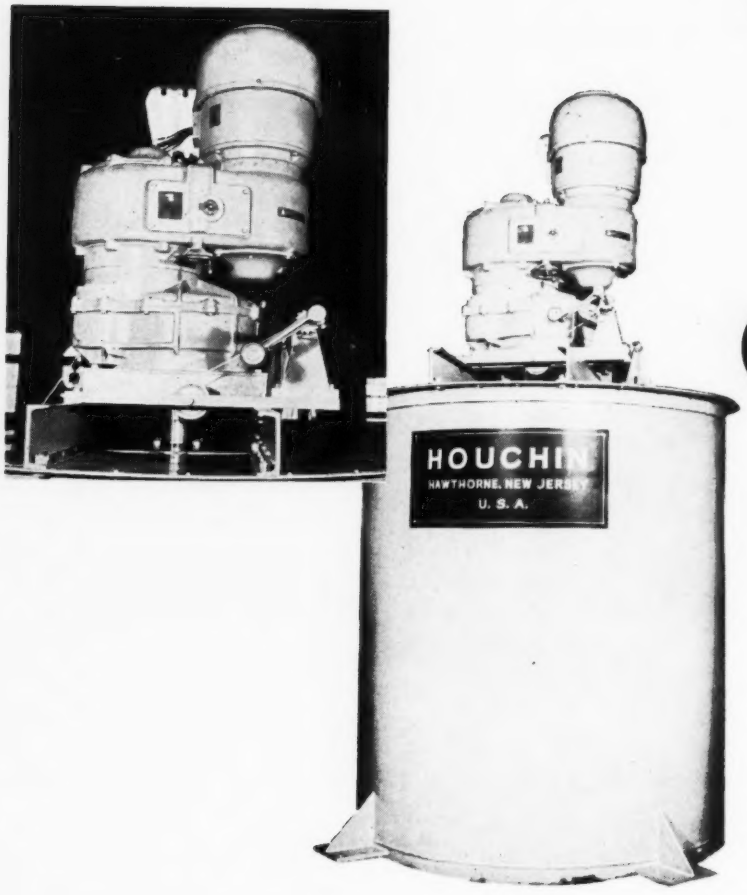
Bulletins and Equipment



Stationary Fuller "Airveyor" in new automated plant of Dearborn Chemical Co., Lake Zurich, Ill. Unit shown unloads bulk dry chemicals from box or hopper cars and conveys material to six storage bins. Unit shown is one of two that can handle 10 tons of material an hour. Full details on plant appear beginning on P. 151.

Announcing

NEW HOUCHIN *variable speed drive* CRUTCHER



MIXES WIDE RANGE OF VISCOSITY AND VOLUME IN A SINGLE UNIT.

This new and versatile Houchin Crutcher was especially designed for mixing high viscosity chemicals and soap stocks. It has a variable speed drive operating at 23.3 to 93.0 RPM, and is instantly adjustable to any intermediate speed required, without stopping the motor. The exact RPM required is set on the variable speed drive by a simple hand wheel adjustment, and shows clearly on a dial. Once set, the speed is fixed.

An adjustable draft-tube assures thorough mixing and makes possible processing of various sized batches, from one third to full tank capacity of 1400 gallons. (Smaller or larger capacities available). A sweep paddle at the inner base of the Crutcher ejects the complete charge and cleans the bottom. Various types of screw and/or mixing blades are available.

Tank shown measures six feet inside diameter and seven feet in height. Tanks are available with inside surfaces of stainless steel, monel, or black iron. The kettles may be jacketed for heating or cooling. Counter balanced hinged cover prevents foreign matter from entering the mix. Speed adjustment and lever for adjustable draft tube can be supplied with remote controls.

Totally enclosed, fan cooled, explosion proof motor is illustrated. Other types available.

Write for full details today.

HOUCHIN MACHINERY CO., INC.

Sixth & Van Winkle Avenues **Hawthorne, New Jersey, U. S. A.**

Manufacturers Of Soap Making Machinery For Over A Century.

Automation for Specialties Plant

Automatic manufacturing processes featured at new Lake Zurich, Ill., plant of Dearborn Chemical Co. Major change for company in handling dry chemicals.

AS an important part of its continuing expansion program, Dearborn Chemical Company's new compounding plant at Lake Zurich, Ill., incorporates the latest and most modernly designed equipment. A major change for Dearborn in the handling of dry chemicals, the new plant represents another step foward in today's trend toward automation.

Decision to build Deaborn's new plant was made as the result of a comprehensive study of the company's existent production facilities and manufacturing methods. The study pointed out the fact that many savings and advantages in production could be realized throught the construction of a modern plant as against a rehabilitation of Dearborn's factory at 1029 West 35th Street in Chicago.

After nearly two years of careful consideration of many possible locations, a 90-acre tract of land was purchased in the Lake Zurich area. The site was chosen not only because of its ideal location, but also because it offers excellent opportunities for future plant expansion.

On March 31, 1953 Robert Adams Carr, president of Dearborn Chemical Co., turned the first spadeful of ground to begin construction of the plant.

Although most of the construction had been completed in early 1955, it was necessary to make certain refinements in the plant's unique manufacturing processes. Because the whole compounding system is so new—with special equipment for the various operations, it took some time to "shake down" the plant. That result, however, has now been achieved and the plant is in full production.

From the time basic chemicals are received until they are packaged for shipment as compounded products, operation of the plant is almost entirely automatic. Push button control enables plant operators to prepare a complicated chemical formula almost as simply as one might dial a telephone number.

Material Receiving

BULK chemicals are delivered to the plant's railroad siding in either box cars, hopper cars, or tank cars. They are switched from the siding to the receiving dock on the south side of the plant by means of a company-owned "Trackmobile." Each car is weighed in on a Fairbanks-Morse scale, with tolerances kept to ± 20 pounds.

Other chemicals, raw materials, and supplies are also delivered, usually by truck, to the south side of the plant. Thus, all material required for any operation in the plant is received in a common area, helping to maintain a generalized flow of material through the plant, which is from south to north.

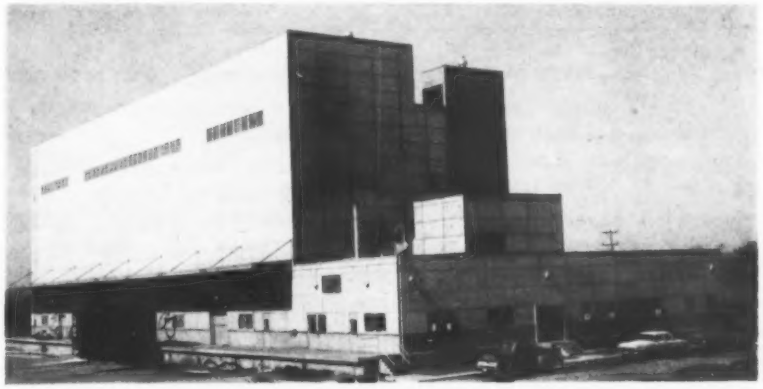
Material Unloading

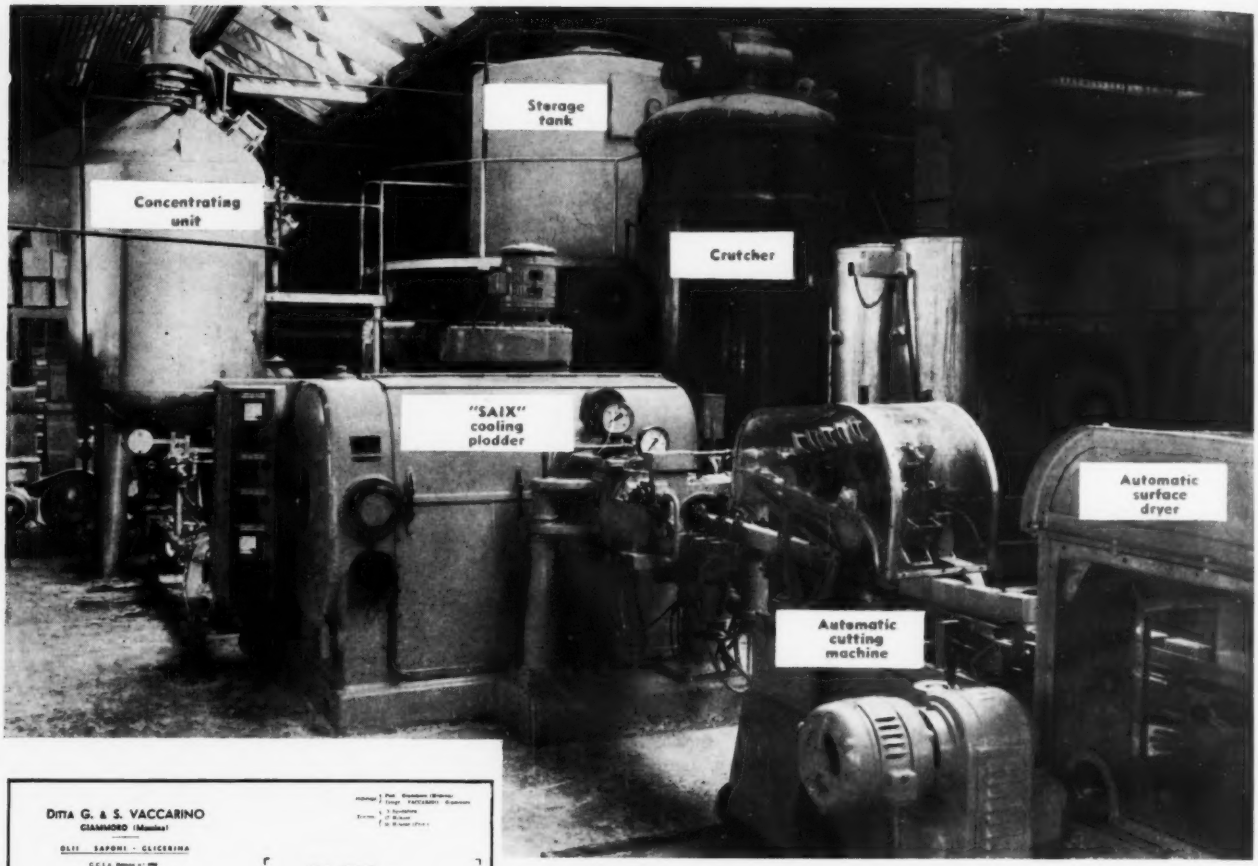
IN the case of bulk dry chemicals, received in either box cars or hopper cars, material is unloaded by means of three Fuller "Airveyors," each capable of handling 10 tons of material per hour. Two of these "Airveyors" are stationary units servicing six storage bins each, and the third is a traveling unit that delivers material to any one of 24 storage bins.

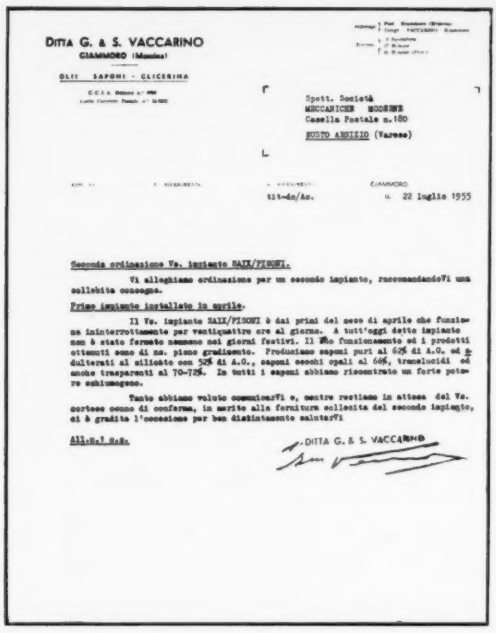
In the case of material received in bags, a special device is used which opens the bags and delivers the material to the Fuller "Airveyor" system.

When small quantities of materials or supplies are received, or those whose chemical characteristics are such that they cannot be stored

Exterior of new, almost windowless Lake Zurich, Ill., plant of Dearborn Chemical Co. Plant and equipment represent major step forward in today's trend toward automation.







DITTA G. & S. VACCARINO
GIAMMORO (Messina)

OLII SAPONI - GLICERINA

Spett. Società
MECCANICHE MODERNE
Casella Postale n.180
BUSTO ARSIZIO (Varese)

GIAMMORO
li 22 luglio 1955

Seconda ordinazione Va. impianto SAIX/PISONI.

Vi alleghiamo ordinazione per un secondo impianto, raccomandandoVi una sollecita consegna.

Primo impianto installato in aprile.

Il Va. impianto SAIX/PISONI è dai primi del mese di aprile che funziona ininterrottamente per ventiquattro ore al giorno. A tutt'oggi detto impianto non è stato fermato nemmeno nei giorni festivi. Il Vho funzionamento ed i prodotti ottenuti sono di ns. pieno gradimento. Produciamo saponi puri al 62% di A.G. ed adulterati al silicato con 52% di A.G., saponi cocchi opali al 66%, transleucidi ed anche trasparenti al 70-72%. In tutti i saponi abbiamo riscontrato un forte potere schiumogeno.

Tanto abbiamo voluto comunicarVi e, mentre restiamo in attesa del Va. cortese cenno di conferma, in merito alla fornitura sollecita del secondo impianto, ci è gradita l'occasione per ben distintamente salutarVi

All.ni 1 dsg.

DITTA G. & S. VACCARINO

Photograph of a "SAIX" plant capable of producing automatically one ton of household soap per hour.

"SAIX" TYPE AUTOMATIC COOLING PLODDER — MOST UP-TO-DATE PLANT FOR THE CONTINUOUS FINISHING OF SOAPS

"SAIX" cooling plodder performs six otherwise separate operations: it chills, homogenizes, controls internal texture of the soap, perfumes, gives translucency if required, and extrudes the soap as a continuous bar of any desired size.

"SAIX" performs these six steps under air tight conditions.

"SAIX" Versatility: Fats of high or low titer and containing high or low moisture content are processed rapidly and efficiently into good quality soaps:

● **pure 62-63% T.F.M. soaps** (containing 28% moisture) ● **filled soaps** (100% sodium silicate — bentonite — soda ash, etc.) down to 35% T.F.M. ● **soaps made with 100% coconut oil** ● **dried soaps, pure or filled, up to 72-73% T.F.M.** ● **high rosin content soaps** (up to 25-30% of rosin on fatty acids) ● **toilet soaps** ● **transparent soaps, without the addition of sugar, soda ash, alcohol, glycerine, etc.** ● **medicinal soaps (carbolic soap, phenol soap, etc.)** ● **industrial soaps** ● **laundry soaps** ● **soaps made with olive oil foots, etc.**

Main advantages over competitive plants on the market: When using the "SAIX" cooling plodder soap need not be dried in order to effect cooling by water evaporation, resulting in the following economies from the use of "SAIX" equipment:

● 100% savings on steam, 50% on cooling water, 50% on electrical power, 70% on labor ● "SAIX" produces soaps crystallized up to 100% in "beta" phase ● Warm water up to (+28° C) can be used to cool the soap, always getting a firm bar ● Production capacity: "SAIX" is manufactured for the following capacities: 0.1, 0.25, 0.5, 1, 2, 3 and more tons per hour ● "SAIX" can be run by an unskilled operator ● "SAIX" can extrude soaps containing from 35% up to 74% fatty acids which can be cut, stamped and packaged immediately without scraps ● "SAIX" refines and homogenizes the texture of soap getting a finished bar free from end markings and stripes ● Transparent soaps produced by a "SAIX" require no further milling and plodding for uniform texture and transparency ● Complete guarantee is given that there are absolutely no changes in fatty acids and moisture percentages between the hot liquid soap fed into the "SAIX" and the resulting bar soap.

● **"SAIX" units can be supplied alone or complete with additional equipment:** concentrating unit, **automatic cutting machine, automatic tunnel, automatic stamping machine, storage tank, soap crutcher** ● **"SAIX" extrudes soap without any worm to force the soap in the compression cone: these worms require the use of high melting point fats and reduce the natural moisture contents of the soap** ● **"SAIX" extrudes firmer bars which retain their shape in storage** ● **"SAIX" allows maximum economy in space** ● **MECCANICHE MODERNE are also makers of: complete plants for toilet and chip soaps, chipping machines, chilling rolls, soap driers, soap conveyors, silos, soap weighing machines, stamping machines, toilet soap pilot plants, plate and frame cooling presses** ● Continuous automatic sulfonating plants, "SULFAN" type from 0.1 to 0.5 tons per hour and more capacity, **spray driers for soap and detergents to make hollow beads or fine powders from 0.25 up to 5 tons per hour capacity.**

MECCANICHE MODERNE

CORSO SEMPIONE, 51 — BUSTO ARSIZIO (Italy)

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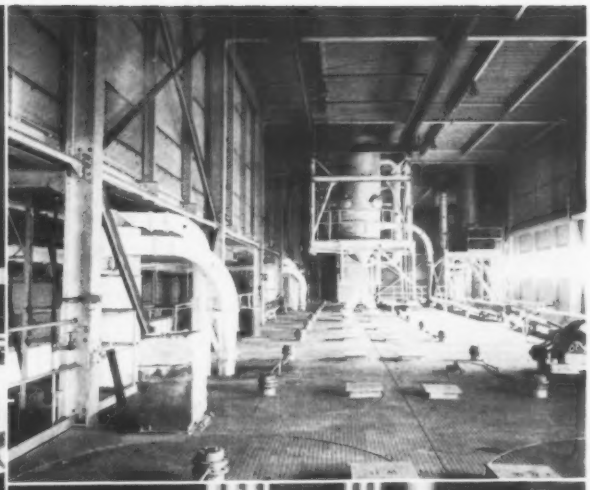
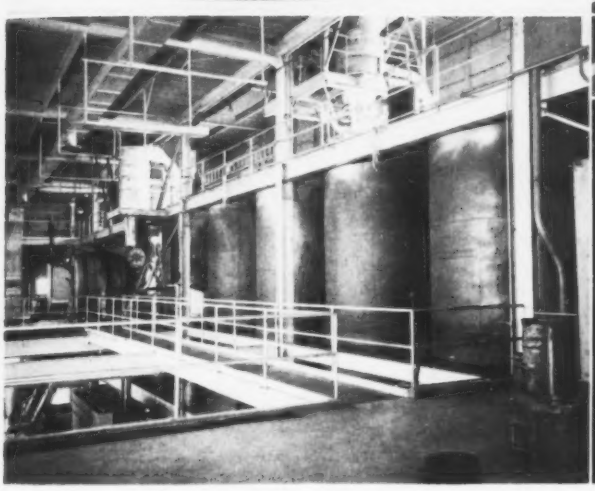
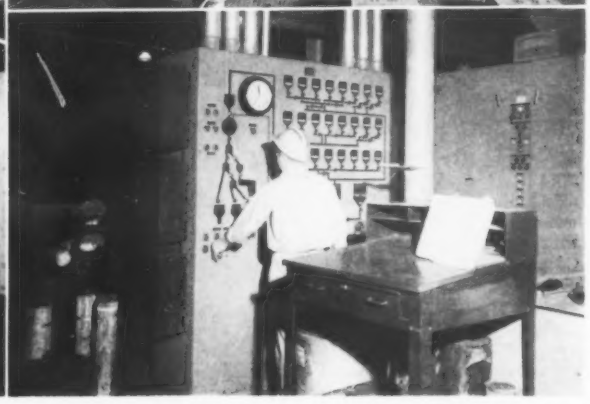






Top, left: general flow of material through plant is from south to north. Bulk chemicals, received in either box or hopper cars, are received at south end of plant and, as they are used in compounding operations, move to north end of plant where they are discharged as packaged products.

Bottom, left: There are 36 storage bins in the plant, each having a minimum capacity of one carload. In storage of high density material, their capacity will exceed 100,000 pounds.

Top right: A traveling "Airveyor" delivers material to any one of 24 storage bins. The unit moves on overhead rails to desired bin.

Bottom, right: The "heart of the plant" is this electrically operated control panel which works in conjunction with a bank of Buffalo automatic weigh-scales. When product is to be compounded, the weigh-scales are set and control panel activated. Chemical ingredients are then fed out of proper bins and compounding proceeds automatically.

in bins, unloading is accomplished by placement of the unit packages on pallets. These pallets are then removed from the receiving dock by electric lift-truck and delivered to the properly designated storage area on the plant floor.

Storage Bins

EACH of the 36 storage bins in the plant has a minimum capacity of one carload. In cases of high density material, the capacity may well run up over 100,000 pounds.

These storage bins are equipped with inter-locked electrical devices which will cut off the "Airveyor" in the event the bin becomes overloaded. Similarly, the bins are equipped with low-level indicators that automatically change bin-feed during compounding operations from an empty bin to a full bin of identical material.

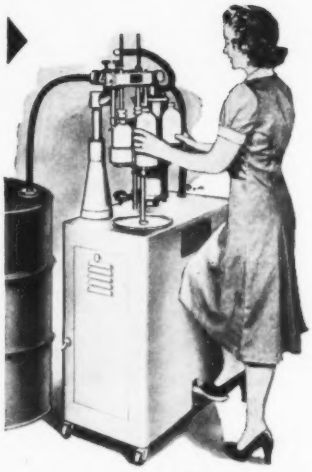
For example, six storage bins are so interlocked that the sequence is 1-2-3-4-5-6, and then back to 1. Such sequential operation insures the usage of material in the same order in which it was received and helps to prevent undue caking or hardening of certain materials.

Weighing and Compounding

CENTRALLY located within the plant is a bank of Buffalo Scale Co. weigh-scales. A complete flow diagram of the plant is laid out on the control panel, along with a series of small electric lights which indicate the flow of material during the compounding operation. After the formula for a given product has been set on the automatic weigh-scales and the control panel activated, the chemicals are automatically fed out of the required bin in the order in which each weight requirement was set on the scales.

Chemicals are fed from the bottom of each storage bin through a rotary vane feeder into a screw conveyor, and then ultimately into an automatic scale hopper. Drive motors for the screw conveyors are of the two-speed type. A reduction in speed occurs automatically when the weight of the chemical being delivered to the scale hopper comes within 50 pounds of the desired weight. With the reduction of the

MODEL B-2 VACUUM FILLER provides efficient continuous production, filling two containers at a time. Handles a wide variety of liquids and semi-liquids. Has automatic product supply; vacuum is adjustable and flow regulated for accurate, clean filling. For containers up to 4⅛" dia. round or rectangular. Efficient. Send for Bulletin B-2.



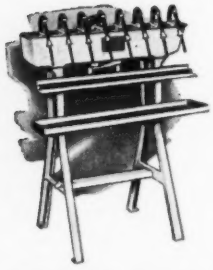
Look to US for Every Liquid Filling Requirement

——whether hand-filling, siphon, semi-automatic or fully automatic filling, there is a U. S. Filler, or an adaptation thereof, to spark your production.

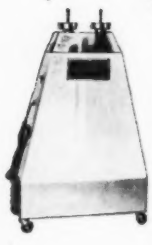
Here the most unusual liquid filling problems are solved regularly by engineers with a background of generations of specialization. If your product has outgrown your present equipment, a U. S. machine engineered to your specific needs, will simplify your operations and increase your profits.

When writing for recommendations, please specify products, size and type of container and desired filling rate in terms of containers per minute, hour or day. Individual Bulletins on all machines mailed upon request; please specify whether for hand-filling, siphon. semi or automatic filling.

MODEL B-49
STRAIGHTLINE VACUUM FILLER for liquids and semi-liquids. Most automatic one-operator multiple filler. Available with or without discharge conveyor. Contact parts of stainless steel, or in plastics on special order. Filling proceeds automatically while empties are loaded. Easy operating lever activates container feed; otherwise operation is completely automatic. Adjustable for AGST to gallon size finishes. A dependable machine where filling cost is a factor. Send for the new Bulletin B-49.



THE U. S. SIPHON FILLER is a highly efficient machine. Adjustable for all types of containers. Stainless steel filling tubes and acid-resistant glass lined tank. Handles all types liquids, including foamy products and products that do not permit agitation. Fills without overflow or spillage. Send for the Siphon Bulletin.



E-Z AIR CLEANER—
Popular companion to semi-automatic fillers for products that require a clean, dry container. Connects to air supply to blow carton lint and dust out of new containers. Handles any size container, up to 40 per minute. Send for E-Z Bulletin.

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U. S. BOTTLERS MACHINERY CO.

Specialists in Liquid Filling and Container Cleaning Equipment

4019 North Rockwell Street — Chicago 18, Illinois

Drumming hoppers discharge the finished product into kegs, drums or bags. The packaged products are then moved on roller conveyors directly to the shipping dock on north side of building.

Bottom: A sample of each batch of compounded material is sent to plant's control laboratory, where it is completely analyzed to assure its consistency in quality before shipment to the customer.

screw feed at this particular point, the remaining 50 pounds are "dribbled" in, thus preventing overweighing of the chemicals required for the formula being compounded.

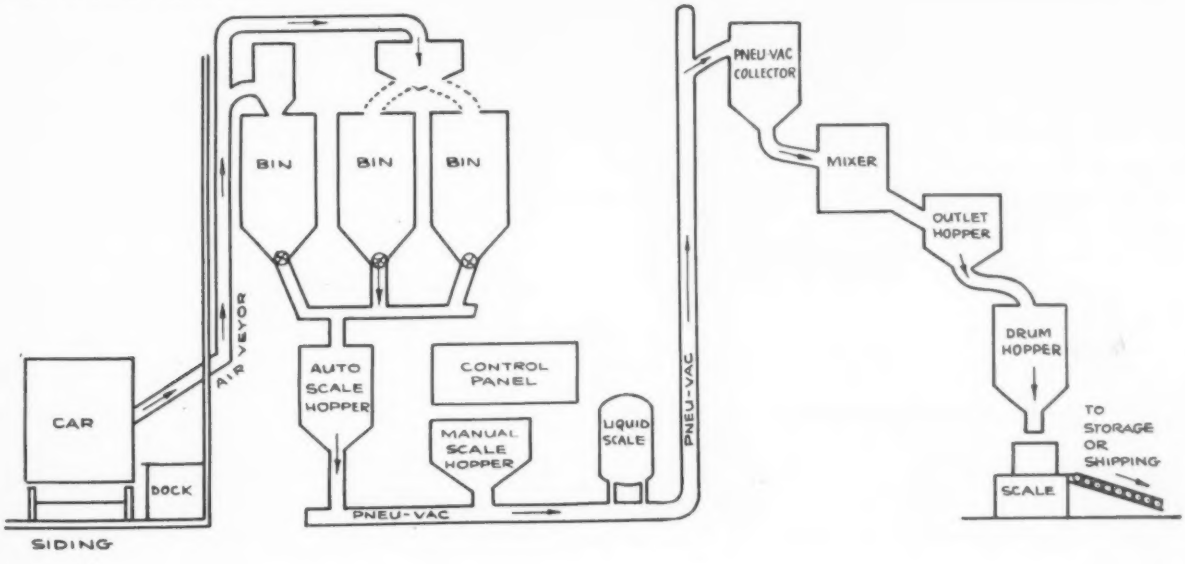
Where very small quantities of an ingredient are required, the material is dumped manually into a separate scale hopper for inclusion in the compounding operation. Liquid ingredients are automatically weighed in a separate scale hopper for subsequent spraying into the mixer.

There are three scales on each of the two production lines. Two of the scales on each line are six-beam units, and the third a 12-beam unit. Each of the two production lines has three-scale hoppers. Two of these on each line are used for the handling of dry materials, and the third for liquids.

After all of the ingredients have been delivered to the scale hoppers and the scales "zero out,"

(*Turn to Page* 211)

Flow sheet of the new Dearborn plant showing route of material from time it is unloaded at plant through various stages of storage and processing until it is packaged and ready to be shipped.

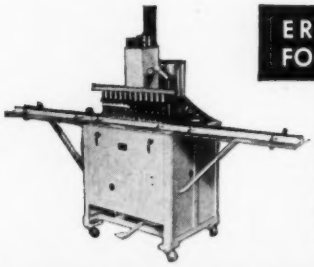


ERTEL BOTTLE FILLERS MEET DEMAND FOR 40-80 BOTTLES PER MINUTE, and

Materially lower Your Production Filling Costs

ERTEL PORTABLE FILLER

This Vacuum Bottle Filler belongs in every plant. Fills batch or sample lots of materials at lowest cost; for small operations where large expensive equipment is not practical. Fully automatic overflow—no drip spouts. Instantaneous flow — won't fill defective or cracked bottle.



ERTEL ESA FILLER FOR SMALL BOTTLES

The most practical filler for small bottles in quantities of 40 to 60 per minute. To appreciate this unit it should be viewed in operation — the finest low cost trouble-free unit on the market.

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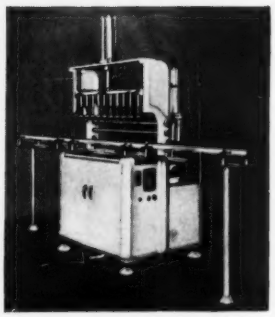
Filling Range 3" to 13" High Bottle

For speeds up to 40 quarts per minute, this precision Ertel filler has no equal. New type spouts positively prevent drippage. Available with circulatory passages either bronze, plated, or stainless steel. Adjustments are simple and require but a few seconds time. If you have a filling problem see the Pneumo-Vac — it's designed for low cost operation.



Ask to have an Ertel representative show you why Ertel Fillers are so enthusiastically acclaimed by users in the pharmaceutical, drug, cosmetic, chemical and food industries.

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- Potassium Carbonate
- Potassium Persulphate
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- Muriatic acid
- Nitric acid
- Soda Ash
- Sodium Bicarbonate
- Sodium Metasilicate
- Silicate of soda
- Silicate of potash
- Trisodium phosphate
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- Borax
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- Red oil
- Sulfuric acid
- Stearic acid
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Book Reviews

New Chemical Dictionary

The *Condensed Chemical Dictionary*, 5th edition, revised and enlarged by Arthur and Elizabeth Rose, State College, Pa., published by Reinhold Publishing Corp., New York, 1956. Cloth bound, 1,220 pages, thumb indexed, price $12.50. This new edition has been expanded from 760 to 1,220 pages containing 30,000 revised entries. Like its predecessors it is designed for use by the chemist and the non-technical man who needs chemical information. A new type-face is used which is a vast improvement in legibility. Many materials are listed under their trade names or coined names if these are more commonly used than their chemical designations. A generous system of cross references makes this possible. Newer fields are extensively covered: there is much useful information, for instance, under the heading "antibiotic." Under "syndets" there is a cross reference to "detergents, synthetic," and here we find greatly expanded and well arranged data on the three main types, and some interesting and revised use information. Under sequestration, which is a new entry, we find a short descriptive paragraph mentioning some of the most generally used modern sequestering agents; the EDTA entry is cross-indexed to ethylenediaminetetraacetic acid and under this heading up-to-date information on properties, derivation and uses is supplied. The new "Condensed Chemical Dictionary" is to be recommended as a practical, comprehensive, and modern work of reference.

★

New Detergent Pamphlets

Four new pamphlets, listing and describing its line of industrial detergents, have been issued by Reddish Chemical Co., Ltd., Stockport, England, it was announced recently. The folders contain information on the firm's "Kinray," "Paracleanser," "Paraplus," "Ray-Gel," "Koslin," and "Trisul" products. "Kinray" is a detergent designed primarily for cleaning aluminum equipment, while "Paracleanser" and "Paraplus" are used in cleaning dairy equipment. "Trisul" is utilized for cleaning food processing equipment. "Ray-Gel" and "Koslin" are bottle washing detergents. Physical and chemical properties and additional suggested applications are also included in the folders.

★

New Columbia Pamphlets

Columbia-Southern Chemical Corp., Pittsburgh, recently announced publication of two pamphlets on caustic soda. The 3¾ x 8½ inch, 12 page booklet on "The Economics of Caustic Soda" contains complete product data such as formulations, costs, price lists and applications. The 8½ x 11 inch, plastic-bound "Caustic Soda Manual" contains 64-pages, including charts, illustrations and diagrams on the analysis, shipping, handling, storage and unloading of the product. Copies can be obtained on request to the company, One Gateway Center, Pittsburgh 22, Pa.

★

Ethylene Oxide Manual

Publication of a technical manual on ethylene oxide was announced recently by Jefferson Chemical Co., Houston, Texas. Copies of the booklet may be obtained on request to the company, P.O. Box 303, Houston 1.

★

New Dow Booklet

Properties and uses of more than 375 basic industrial and pharmaceutical chemicals of Dow Chemical Co., Midland, Mich., are described in a new booklet recently made available by the company.

The new 40-page edition includes descriptive information on principal product groups of Dow chemicals plus a cross-reference index of the chemicals. Included among the product groups are alkalies, flotation agents, glycols and glycol ethers, methocel, inorganic and organic acids and many other inorganic and organic compounds.

Copies of the booklet can be obtained upon request from the Technical Service and Development Division, Dow Chemical Co., Midland, Mich.

★

New Dearborn Folder

A new four-page folder on "Contract Blending," was issued recently by Dearborn Chemical Co., Chicago. The pamphlet provides complete information on the company's blending division, including production, packaging, labeling and shipping of a variety of formulations. A section is also devoted to a detailed description of facilities at Dearborn's new blending plant at Lake Zurich, Ill. Copies of the folder are available on request to the company, Merchandise Mart Plaza, Chicago 54.

★

New MCA Data Sheets

The Manufacturing Chemists' Association, Inc., 1625 Eye St., Northwest, Washington 6, D. C. recently announced publication of revised safety data sheets on trichlorethylene (SD-14), ethyl ether (SD-29), and phthalic anhydride (SD-61). The sheets give properties and necessary information for safe handling and use of these chemicals. Copies of the three sheets can be obtained from the association for 30 cents each.

★

Sulfuric Acid Data

A new technical bulletin on sulfuric acid has been issued by General Chemical Division of Allied Chemical & Dye Corp., New York, it was announced recently. Covered in the brochure are physical properties, storage and handling methods and equipment and methods of analysis of sulfuric acid and oleum. In addition, product data is supplemented by numerous charts, tables and graphs. Copies can be obtained on request to the company, 40 Rector St., New York 6, N. Y.

CaPeM SCREW CAPPERS

Speed production for Texize Chemicals, Inc.

This Model D-6-F Rotary CaPeM increased production to such an extent that Texize Chemicals, Inc., Greenville, S. C. recently ordered a duplicate. This completely automatic line is operated continuously at production rates in excess of 200 bottles per minute.

CaPeM Screw Cappers apply all types of metal and plastic screw caps to jars, bottles, cans and jugs ranging in size from 1 oz. to gallons. Speeds range from 40 to 300 containers per minute. Write for complete information.

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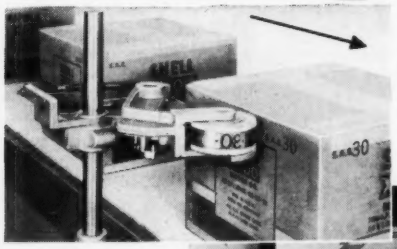

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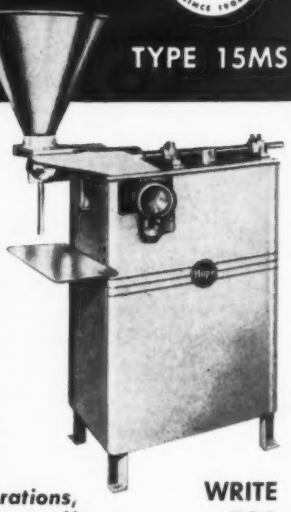

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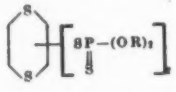
NEW Patents

The data listed below is only a brief review of recent patents pertinent to the readers and subscribers of this publication. Complete copies may be obtained by writing to the publisher of this magazine, MacNair-Dorland Co., 254 W. 31st Street, New York, 1, N. Y., and remitting 50c for each copy desired. For orders received from outside of the United States the cost will be $1.00 per copy.

No. 2,774,735. Detergent Bars, patented by Paul Becher, Murray Hill, N. J., assignor to Colgate-Palmolive Co., New York. A detergent composition is revealed in the form of bars or cakes having improved processing properties and reduced tendency to slough, said composition consisting essentially of at least about 50% by weight of higher fatty acid water soluble soap; about 5 to 12% by weight moisture; about 5 to 30% by weight of water soluble salt of higher fatty acid monoglyceride monosulfate; about 3 to 7% by weight of non-ionic detergent comprising hydrophobic polyoxypropylene glycol of molecular weight at least 900 condensed with sufficient ethylene oxide to prepare a water soluble product; and about 0.5% to 3% by weight, sufficient to improve the physical processing characteristics and sloughing resistance of said bars or cakes but insufficient to deleteriously affect the foaming properties thereof, of polymeric material prepared by adding propylene oxide to ethylene diamine until a condensation product having a molecular weight of about 2,000 to 6,000 is obtained, and then adding ethylene oxide to said condensation product until said ethylene oxide constitutes about 10 to 80% of the final polymer.

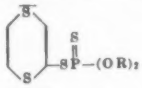
No. 2,766,165. Dithiandithiol S, S-Bis(O,O-Dialkyl Phosphorodithioate) and Its Use as an Insecticide, patented by Albert H. Haubein, Christiana, Del., assignor to Hercules Powder Co., Wilmington, Del. Revealed is a new composition of matter a compound of the formula



in which each R represents an alkyl radical having 1–4 carbon atoms.

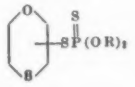
Also claimed is a pesticidal composition comprising the above compound and an insecticidal adjuvant.

No. 2,766,166. 2(Dialkoxy-Thionophosphonyl-Thio)-1,4-Dithianes, patented by Albert H. Haubein, assignor to Hercules Powder Co. This patent covers a new composition of matter a compound of the formula



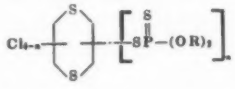
in which each R represents an alkyl radical having 1–4 carbon atoms.

No. 2,766,167. Thioxanethiol S(O,O-Diethyl Phosphorodithioate) and Pesticides Containing the Same, patented by Albert H. Haubein, assignor to Hercules Powder Co. Claimed is a new composition of matter a compound of the formula



in which each R represents an alkyl radical having 1–4 carbon atoms and a pesticidal composition comprising this compound and an insecticidal adjuvant.

No. 2,766,168. Polychloro-Poly-(Dialkoxythionophosphonyl-Thio)-1,4-Dithianes, patented by Albert H. Haubein, assignor to Hercules Powder Co. Covered is a new composition of matter a compound of the formula



in which each R represents an alkyl radical having 1–4 carbon atoms and n is a number from 1 to 2.

No. 2,766,169. Organic Dithiophosphates Having a Chloro-p-Thioxane Nucleus, patented by Albert H. Haubein, assignor to Hercules Powder Co. This claim covers a new composition of matter a compound of the formula

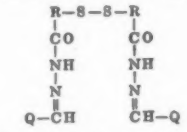
in which n is a number from 1 to 2 and R is a lower alkyl radical and a pesticidal composition comprising this compound and an insecticidal adjuvant.

No. 2,773,801. Dentifrice Compositions Comprising a Normally-Solid Water Soluble Condensation Product of Ethylene Glycol and Polypropylene Glycol, patented by Arthur L. Fox, Short Hills, N. J., assignor to Colgate-Palmolive Co., New York. A dentifrice composition is covered comprising a polishing material and about 0.1 to 10% by weight of a normally-solid water-soluble condensation product of ethylene oxide and polypropylene glycol, said product having a molecular weight of about 5,000 to about 10,000 and an ethylene oxide content of about 75–90% by weight.

No. 2,773,834. Shampoo Compositions Containing Monomethylol Dimethyl Hydantoin, patented by Hyman Henkin, Bayside, N. Y., assignor to Colgate-Palmolive Co., New York. A shampoo composition is disclosed comprising at least about 5% by weight of an organic detergent selected from the group consisting of sulfated and sulfonated detersive salts in an aqueous medium which is normally subject to bacterial and mold growth and a minor proportion up to about 1% of 1-methylol 5,5-dimethyl hydantoin sufficient to inhibit said growth.

No. 2,773,835. Liquid Shampoo Composition, patented by Albin Fritjof Anderson, Allendale, N. J., assignor to Colgate-Palmolive Co., New York. This patent describes a liquid shampoo composition characterized by having improved resistance to phase separation on long standing which comprises about 5 to 45% by weight of a water-soluble salt of a sulfated monoglyceride of higher fatty acids as a detergent, from about 0.5 to about 25% of urea, and the balance being water, said shampoo having a pH within the range of 5.5 to 7.0.

No. 2,767,173. Bactericidal and Fungicidal Compounds, patented by Leon Katz, Springfield, N. J., assignor to Schenley Industries, Inc., New York. Described is a compound of the group represented by the formula



in which each R is a radical of the group consisting of 2-phenylene and 4-chloro-2-phenylene radicals, and each Q is a radical of the group consisting of 2,4-dichlorophenyl, 3,4-dichlorophenyl, 2-(lower alkoxy) phenyl, 4-(β-chloroethoxy) phenyl and 2 and 4-quinolyl radicals.

No. 2,767,115. Insecticidal Compositions of Chlorinated Turpentine Hydrocarbons and Methods of Stabilizing Same, patented by Abner Lyndale Schultz, Oberlin, and Robert R. Bloor, Lorain, O., assignors to B. F. Goodrich Co., New York. This patent teaches a method of stabilizing a halogenated insecticide comprising a chlorinated mixture of camphene and a hydrocarbon selected from the class consisting of alphapinene, beta-pinene, mixtures thereof, the step of adding up to about 5% by weight of an unchlorinated compound selected from the class consisting of alpha-pinene, beta-pinene, camphene and turpentine to said chlorinated mixture.

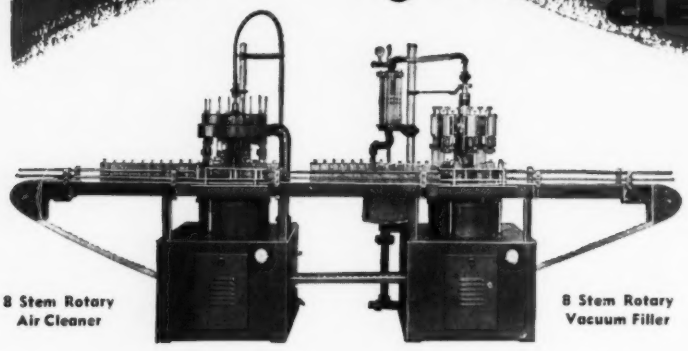
—★—

Italian Group Honors Wells

F. V. Wells, editor of *Soap, Perfumery and Cosmetics*, London, recently received an honorary membership in the Italian Cosmetics Society. He is the only foreign member in the Society of French Perfumers (Societe Technique des Parfumeurs de France). Mr. Wells is a frequent contributor to *Soap and Chemical Specialties*.

Kiefer's NEW TWOSOME

TANDEM CLEANER-FILLER



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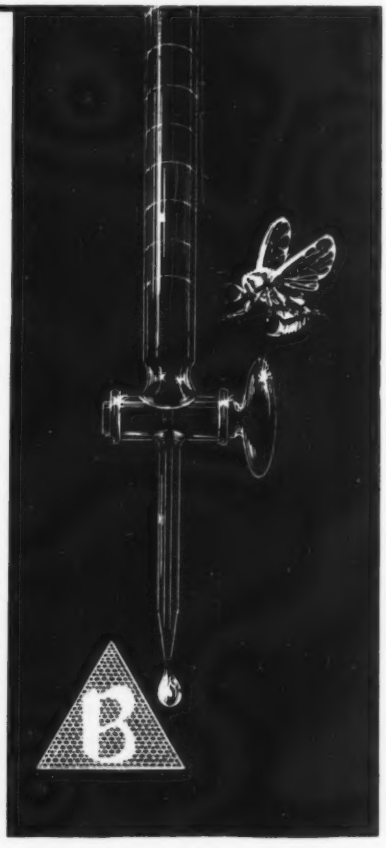

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Products and PROCESSES

New Anti-Foam Agent

A new industrial anti-foam agent was introduced recently by Hodag Chemical Corp., Chicago. Called "Antifoam S-88," the product is designed for use in activated sludge waste treatment plants of industrial companies and municipalities. It can be applied manually or automatically to aeration tanks and is available in 55 gallon drums and five gallon pails. A technical data sheet describing properties and applications of "Antifoam S-88" can be obtained from the company, 7247 North Central Park, Chicago 45.

—★—

Solvent Resistant Grease

A new lubricating grease, designed to resist washing action of almost all petroleum and chlorinated solvents, has been introduced by Pennsylvania Refining Co., Cleveland, it was announced recently. The lubricant can be used in cleaning pumps or other equipment used in handling solvents. It is said to be impervious to naphtha, kerosene, gasoline, LP gas, fuel oils, coal tar solvents, trichlorethylene, perchlorethylene, and orthodichlorbenzene. In addition, the new product is claimed to have a relatively stable consistency and may be pumped into a hand grease gun at extremely low temperatures.

—★—

Auto Cleaner-Polishes

An automotive cleaner which also functions as a polish may be formulated by including silicone oil. A typical wax-silicone cleaner-polish is composed of:

	% by weight
silicone oil	2
oxidized microcrystalline wax	1
oleic acid	2
white spirit	36.9
morpholine	0.9
diatomaceous silica	9.8
air-floated clay	2.4
water	45

The first four ingredients are brought into solution at 140°F; the last four are slurried together and heated to the same temperature; the solvent solution is then added to the slurry with high speed agitation. A fine emulsion results with good suspending properties for the abrasive. This product is applied like a conventional liquid cleaner. It offers the advantage of easier abrasive wipe-off and leaves a wax silicone film of good gloss and durability, enabling it to be used for single application treatment.

Another formula for no-rub automobile polish suggested in a bulletin of Petrolite Corp., New York, contains: "Crown Wax 23", 34 parts; silicone (5,000 cs. visc.), 20 parts; white spirit, 1,300 parts. Wax and silicone are mixed with 20 percent of the solvent by heating to 190 to 200°F. When solution is complete, the remaining solvent at about 120°F is added with agitation. The mixture is cooled with agitation and the agitation continued during packaging to prevent settling. This formula was found to be easily adaptable to pressure packaging, by replacing part of the mineral spirit by aerosol solvents.

A silicone type emulsion polish may also be produced as follows: silicone oil, four percent; microcrystalline wax (high m.p. about 70°C), two percent; and stearic acid, two percent. When molten, and at a temperature of 95°C, one percent triethanolamine is mixed into the molten components at about 70°C; 10 percent white spirit is added; finally 63 percent soft water, warmed to 70°C is added with strong and constant stirring. Mixing is continued until the emulsion has cooled. Percentages of stearic acid and triethanolamine may be increased slightly to enhance stability.

An aerosol type silicone polish may be made by dissolving silicone oil in aerosol solvents with or without addition of conventional solvents such as mineral spirit. Any addition of waxes must be made very cautiously as precipitation might block the aerosol valve. In fact the author does not recommend the use of waxes in aerosol car polishes. It is possible, however, to use a liquid emulsion polish and have the aerosol solvent only as a propellant as in the case of aerosol shave creams.

A. Davidsohn, *Soap, Perfumery & Cosmetics*, Sept. 1956, p. 1019.

In a previous abstract of this article by Dr. Davidsohn, which appeared on page 129 in the January 1957 issue of SOAP *and Chemical Specialties*, the reference crediting Dr. Davidsohn as the author of the original article, unfortunately was omitted. SOAP regrets this omission.

—★—

du Pont Emulsion System

E. I. du Pont de Nemours, Inc., Wilmington, Del., recently announced development of a new emulsifying system which permits aerosol packaging of water-based solutions and active ingredients not strictly soluble in commonly used propellants. The system is based on water-in-oil emulsions where water in the final formulation is dispersed in "Freon" propellant.

According to the announcement, the new process may make possible an expanded line of aerosol products such as antiperspirants, deodorants, skin fresheners, fungicides, hair sprays, sun tan sprays, insect bite lotions and insect repellents. In addition, the new system is expected to be applicable to metal cleaners and polishes, mothproofers, air deodorizers, weed killers, hand cleaners and antistatic agents.

The new system is designed to permit a wide variety of discharge patterns, ranging from soft, space-type sprays to wet, residual-type sprays. It is also claimed to extend the range of formulations for a great many aerosol products. In cosmetics and pharmaceuticals, formulations have been developed which create no undesirable cooling when applied to the skin and

(*Turn to Page* 200)

Uniformity is the telling ~~selling~~ point of *Raymond* industrial chemicals

PENDIT® WA COSMETIC IS *UNIFORM: An aqueous sodium lauryl sulfate whose batch-to-batch consistency will eliminate at least one (often major) variable in your process. Pendit® WA Cosmetic is supplied in three viscosities, and other lauryl sulfate salts are also available.

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- ✔ Fat liquoring leather
- ✔ Acid peeling of fruits
- ✔ Metal plating
- ✔ Metal cleaning
- ✔ Metal burnishing compounds
- ✔ Foaming fire extinguishers
- ✔ Textile scouring
- ✔ Industrial emulsions
- ✔ Preparation of liquid and paste cream shampoos
- ✔ Cosmetic suspensions and emulsions
- ✔ Liquid dishwashing compositions
- ✔ Car washes
- ✔ Personal cleansing products

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- ✔ Fabric softener
- ✔ Textile lubricant
- ✔ Mold inhibitor
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- ✔ Germicide
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- ✔ Organo tin esters as polyvinyl chloride stabilizers
- ✔ Esters as chain transfer agents in emulsion polymerization
- ✔ Hair waving
- ✔ Stabilizer for acrylonitrile polymers
- ✔ Intermediate for extreme high pressure lube oil additives
- ✔ Depilatory
- ✔ Intermediate for special textile softening and dying agents

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PRODUCTION Clinic

By E. G. Thomssen, Ph. D.

REGULATIONS, whether local, State or Federal, can, at times, be extremely annoying in the operation of a plant. We do not quarrel with the fact that in some cases the overall results of such regulations are necessary and, in fact, beneficial to the well being of our industry. However, too much regulation is burdensome and, generally, unreasonable. Such a situation is made worse when dealing with the bureaucratic type representative of a regulatory agency of government. There is something in the make-up of such persons who assume, when they are put into a government job of this sort, that they have all the answers and know more about a particular business than the person who is actually conducting it efficiently.

In other cases, inspectors seem to feel that all business men are dishonest and are trying to evade the law. Such an attitude may be based on a past experience in which a business man was involved in an unethical practice. As a result, such officials feel that all business men try to skirt regulations and ignore the law. Because of this, government representatives often snoop around plants excessively and, in general, make a nuisance of themselves. Usually the plant man is at a disadvantage because he is required to conduct the inspector through the plant, furnish all the information requested or incur the ill will of the particular government department involved. Unless the plant man "cooperates" fully with the requests of the representative of government, further unpleasantness can follow. In this, the freest of nations, business people resent such inspections and regulations unless they are clearly beneficial to the industry and the consumers of the industry's products.

More and more industry realizes that self-regulation is more desirable, more efficient and more realistic than that imposed by legislative bodies. This is particularly true in any branch of the chemical industry, in which the technical aspects of the problems are too involved for the layman to grasp.

In many industries codes have been devised to which member firms in those industries subscribe. Frequently they seek the assistance of law by suggesting constructive legislation to enforce the provisions of such codes. In other cases, industry groups, or trade associations suggest model laws covering special situations such as standards for brake fluid, state laws dealing with regulations concerning labeling and marketing of insecticides, etc. Often, the adoption of a model bill by one state may be followed up by the passage of a similar, or the same, law in other states.

An example of this mutual association of procedure may be found in the citrus industry of Florida. There the industry regulates the quality of the fruit, curtails shipments so as not to glut the market and sets up restrictions to prevent the spread of disease or insect infestation to which the fruit might be subject. Such action has resulted in very definite benefits to the consumer and the industry.

Dr. E. G. Thomssen

Trade associations have shown an increasing realization that working with legislative bodies and appointed administrators is very helpful. In recent years more regulatory officials are attending trade association and other industry meetings, where they take an active interest in the proceedings by listening to the discussion, actively participating as speakers and/or meeting many industry representatives on a friendly basis. Such meetings give the government representative and the business man an opportunity to discuss freely their mutual problems. By getting to know each other better, and in a more or less social atmosphere, each party gains a fuller insight into their respective fields. They feel that they can call on each other for assistance in solving any problems that might arise, which is one of the great benefits of such an association.

While we in this country often bemoan regulation, business in the U.S. is much better off than those in many other countries. Recently I corresponded with the production superintendent of an Australian company interested in sanitary chemicals. His disgust with conditions there is interesting and possibly consoling to the U.S. business man. I quote one portion of his letter: "Don't for goodness sake come down to Australia if you expect to see sanitation within even 50 percent efficiency of what you described as existing in England and Europe. I have a friend from America working with me now and he is simply appalled at the conditions. Perhaps the less I say the better.

"You people who live in America are certainly highly privileged, for with many dollars in your pockets you can go out and buy anything you want, to make

Looking for improved middle and late knockdown for your budget aerosol insecticide?

Here's what

Du Pont 90% Methoxychlor

Oil Concentrate Insecticide can contribute

CSMA OFFICIAL AEROSOL TEST—LARGE GROUP

	Aerosol Test Knockdown			Aerosol Test Mortality
	5 min.	10 min.	15 min.	
Basic formula* containing 2% DDT	12	28	57	94
Same formula, but with 2% methoxychlor substituted for DDT	22	51	80	85
Official Test Aerosol	29	40	56	86

Note the great boost that methoxychlor gives to middle and late knockdown. It can do the same for your formula and at very low expense. Contact the district office nearest you.

E. I. du Pont de Nemours & Co. (Inc.)
Grasselli Chemicals Department, Wilmington 98, Del.

San Francisco 4, California.....111 Sutter Street
Atlanta 8, Georgia.....739 West Peachtree Street
Minneapolis 2, Minnesota.....1207 Foshay Tower
Cleveland 14, Ohio.....1321 National City Bank Bldg.
Wynnewood (Philadelphia), Pa.....308 E. Lancaster Avenue
Houston 25, Texas.....1100 East Holcombe Blvd.

*The basic formula is a widely sold, low-priced aerosol containing synergized allethrin, another KD agent, plus 2% DDT.

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

your personal comforts so beautiful it just doesn't matter.

"Pleased to learn from you that Australian conditions may improve. My gosh! They will have to improve a lot before they get back anywhere near to normal. I have just finished contacting the Government officials, as we want to import raw materials to make some of our chemical products. I cannot spend a pound as I want to. I must first get an import license from the Government and that, I might add, is just about next to impossible.

"You may think conditions are good in Australia, but I am going to tell you they are *bad* — and I could spell that in capital letters. What American trader would put up with the inconvenience of first obtaining a license from the Government to spend a few dollars on the purchase of raw materials — and essential raw materials at that.

"I just want you to pay attention to this, Doc. No one in this country can buy anything on the world market unless the Government has first issued a permit to do so. Granted, some of these permits are issued pretty well on an automatic basis because the permits are worked on a quota basis, established on purchases over a certain period, say 1953-1954. I always thought a business man had the right to say where and when he would buy his raw materials and, after that, he was left to arrange finances as best he could.

"The Government down here even controls the private banks and through an edict laid down by the Commonwealth authorities, bankers have to say yes or no to clients. I tell you things are bad down here in Australia, and they will stay that way until we all get a little bit of common sense and start working harder. The only commodity we can export with any degree of certainty is wool, and so we live on the sheep's back."

It is fortunate that our country is still a democracy where business has considerable leeway. In recent years the attitude of the government has been favorable. In many parts of the world official interference is carried to the limit. Our industries thrive more rapidly under freedom of action than through unreasonable intervention by bureaucrats such as my Australian friend discusses.

Degreasing Surfactant

A NEW emulsifier, "Ninate 411," offered by Ninol Laboratories, Inc., Chicago, is used in the manufacture of kerosene type degreasers. Due to its more efficient, faster degreasing properties it has had a favorable reception. Samples and data sheets which give full information are available.

New Kiefer Filling Unit

Karl Kiefer Machine Co., Cincinnati, recently announced the introduction of a new model monopiston filling machine. The new unit, which is equipped with a sanitary streamlined cabinet base, is claimed to be suitable for use in the chemical, cosmetic and pharmaceutical industries. The machine is available in the number one size, which has a delivery of one-half to 16 ounces; and the number two size, having a stroke output of two to 32 ounces. If both sizes are utilized, only an additional cylinder, piston and adapter are necessary for operation. All parts contacting the product, with the exception of gaskets and seals, are fabricated with stainless steel and "Teflon" and are said to be easy to clean.

New monopiston filling machine of Karl Kiefer Machine Co., Cincinnati.

Spray Dryer

NICHOLS ENGINEERING & RESEARCH CORP., New York 5, N. Y., now offers a pilot spray dryer, seven and one-half feet in diameter, which is highly flexible for spray drying testing. It is possible to conduct tests with wheel or spray nozzle atomization. The sprayed product may be cooled if necessary. The unit evaporates up to 250 pounds of water per hour and is equipped with an indirect oil-fired air heater. The dryer is large enough to permit scale-up to industrial size drying equipment.

The company also has a 16 foot spray dryer for full scale testing to substantiate pilot plant results. The manufacturer offers to cooperate with anyone who wishes to investigate fully the potentials of spray drying without having to buy new equipment.

Shipping Carton Marker

A SYSTEM of addressing shipping cartons more rapidly and cheaper than by conventional methods is possible by the use of the Weber Label-Frame System. To use this system, shipping cartons are preprinted with the label frame. A hand device then prints the address, etc., into this frame, from an inexpensive stencil which is individually typed. This device may also be equipped with a counter. The ink reservoir holds enough ink for up to 10,000 impressions. Addresses may be printed at the rate of 40-50 per minute. Further information is available from Weber Marking Systems, Mt. Prospect, Ill.

Storage Racks

THE use of soundly designed storage racks can effect many economies in a manufacturing plant. Mechanical Handling Systems, Detroit 12, Mich., engineers racks for a wide variety of uses. Among the types made by this firm,

(*Turn to Page* 169)

Perfumer's Notes

ON A FEW VERONA SPECIALTIES

ISO-BUTYL FURYL PROPIONATE— A top note of freshness and fine aroma for perfumes. Also used in flavors as an addition to Pineapple, because of its characteristic aroma and freshness.

ALPHA-METHYL CINNAMIC ALDEHYDE— A base for synthetic Oil of Cassia, to which it adds softness and stability.

CYCLAMAL®— Stable in perfumery. Will not discolor or irritate in cosmetics and soaps. Used up to 5% in perfume bouquets for its Lily of the Valley-Muguet character. The exceptional purity of Verona Cyclamal makes it outstanding for its clean, fresh aroma, free from fuzzy by-notes.

FLORANOL— A chemical with a soft, slightly fruity Rose note, but with considerable power and stability.

Write for further information.
Investigate these additional VERONA specialties:

CYCLAMAL CYCLO ACETAL • DIMETHYL OCTANOL SPECIAL
RESEDALIA • VERONOL • ROSANOL

Sole representative in the United States for J. & E. Sozio, Grasse, France.

Resinoides Essential Oils Natural Absolutes

Write us for our complete list of specialties and other aromatic chemicals.

PRODUCTS BUILD SALES FOR *Your* PRODUCTS

Aromatics Division

VERONA CHEMICAL COMPANY

Plant and Main Office: 26 Verona Avenue, Newark, N. J.
1210 Rosedale Avenue, Chicago, Ill.

SOAP PLANT Observer

By John W. McCutcheon

LAST month we referred briefly to a project involving the standardization of test methods in the detergent industry. Formation of national committees for this purpose was proposed at the First World Congress for Surface Activity held in Paris two years ago. These national bodies will meet at the Second World Congress, scheduled to convene in London from April 8 to 12. We understand that several European countries have organized such national committees of surface activity which will attempt to work on internationally agreed standards and terminology at the forthcoming London meeting. The United States has not yet formed such a body, but it is felt that representation on the international committee is highly desirable. The author is currently making efforts in this direction and will report results in this column in due course.

No doubt a large American contingent will attend the congress. April is a lovely month in England, witness Robert Browning:

Oh to be in England
Now that April's there,
And whoever wakes in England
Sees some morning unaware,
That the lowest boughs and the brushwood sheaf
Round the elm-tree bole are in tiny leaf
While the chaffinch sings on the orchard bough
In England—now!

Probably no chaffinches are fluttering around London, but I'm sure the duties of the conference will permit an afternoon boat trip up the Thames to Windsor, or a bus trip to Eton or Oxford or Stratford-on-Avon and you may indeed get the bird! To Americans visiting England for the first time, the writer offers, (with due apologies) the following comments: The people of England are very proud, particularly proud of their past and the symbols which represent it. The changing of the guards, for instance, is an important ceremony; be careful not to get in the way.

Some unfortunate American tourists produce a bad impression and you may have to overcome a bit of a handicap on occasions, created by their misdeeds. For example, the writer and his wife went to the Palladium one night and found an American couple seated next to them. Their first words of introduction were spoken in nice clear tones, audible over five rows each way, and ran something like this: "We are going to fourteen countries, are staying at the Dorchester and haven't found a thing we can eat so far in England." What a beautiful way to make friends and influence people! If you are understanding, grateful and polite, the writer is sure you will find the English people, also understanding, co-operative and very anxious to please. See you in England in April.

* * *

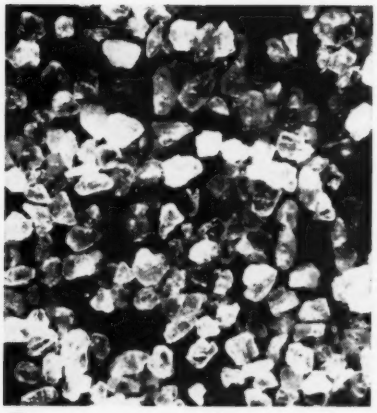
IS there something new developing in personnel training methods in America? The shortage of technical personnel is obvious from advertisements in trade journals which now simultaneously extoll the merits of a product and solicit the reader's interest in applying for a job. This seems to the writer a bit of a mix-up, and thank goodness, the detergent industry has so far escaped this trend. With this type of advertising going on, plus the straight advertisements for electronic engineers, missile experts and what-not, it seems possible to the writer that the detergent industry will be unable to meet its technical personnel requirements within the next few years. Who wants to be a plain soap chemist when he can be a guided missile expert, or an interplanetary space pilot! A vigorous program should be started to train men in the field of fat and oil chemistry and other subjects related to the detergent industry. Attempts to date have been very feeble.

Furthermore, are our methods of handling applicants who apply for jobs out of date? The quality of employees throughout an entire organization may depend largely on the way this job is done. A young psychologist, radiant with hope and a fist full of tests can do more to sour the pudding than a pinch of arsenic. I wonder how many present executives could pass the tests of their own companies if they reapplied for their jobs incognito. The results would probably cause a riot. We do not suggest that tests be abolished, or that the use of trained psychologists for personnel work is not a good thing. But we do suggest that development of the subject to date may be incomplete and that there is great danger in putting too much faith in tests, and not enough in matters that cannot be expressed in the tests.

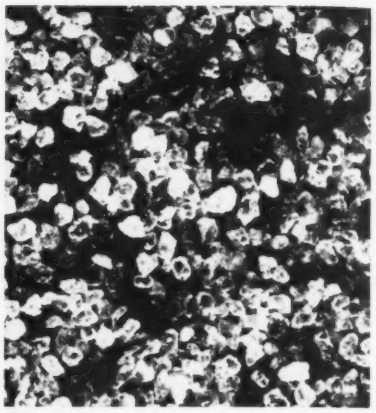
* * *

FREE symposiums for the benefit of the detergent industry are being held from time to time by the American Chemical Society at its sectional and regional meetings, and by the American Oil Chemists' Society at its summer school. Free in this case means that costs cover only board, room, etc.

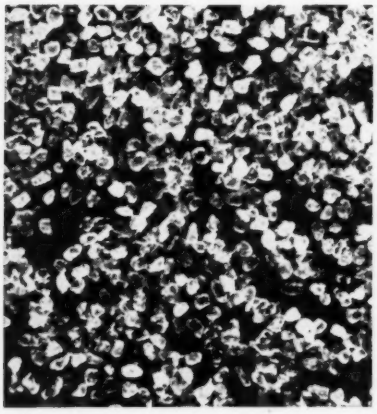
1. REPACKAGE these sparkling *Pea No. 1* crystals just as they come from the drum. Clean, dry, non-oily, they give maximum sales appeal to your product.



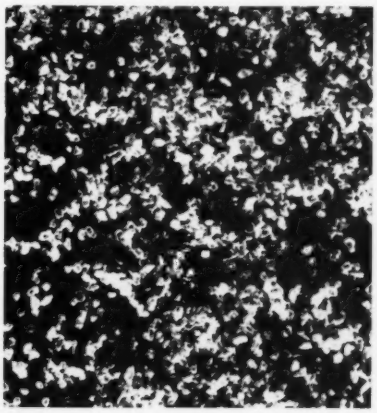
2. ADD VARIETY to your mothicide line with smaller, free-flowing *Pea No. 2* crystals. Repackage them as they are, or perfume them without melting.



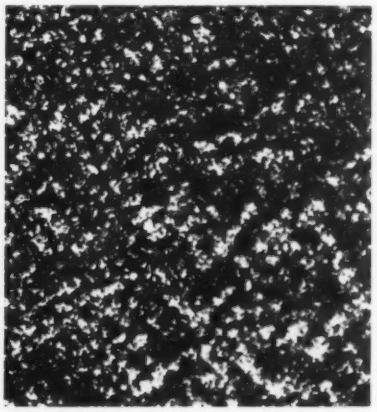
3. A POPULAR SIZE for sprinkling on clothes, *Rice No. 1* sublimes quickly to an extra-high concentration of pleasant-smelling, moth-killing fumes.



4. FEED POWER PRESSES with *Rice No. 2*. These crystals are just right for compressing into blocks or pellets. They flow freely; refill dies rapidly.



5. IN FOOT PRESSES, *Rice No. 3* works best. The crystals are free-flowing, small enough to pack and compress with little effort, for fast production.



6. MELT THIS SUPERFINE *Powdered* size for molding into blocks or pellets. It melts rapidly, saves production time. Easily colored or perfumed.

All photos actual size

6 ways to market a purer *para*-dichlorobenzene product

Get more repeat orders for your *para*-dichlorobenzene products—by offering your market a line made with sparkling 100% pure PARADI®.

Your retail customers will like these sparkling white, dry, non-oily crystals. They sublime completely, leaving no residue or odor, because they're 100% Hooker *para*-dichlorobenzene, with no *ortho*-.

Whether you repackage *para*-dichlorobenzene, compress it into blocks, or use it directly in process, you'll find extra convenience and real production economy in the wide choice PARADI gives you.

For a farm pesticide and weed killer, try our 7th form, *granulated* PARADI.

You can have PARADI shipped promptly in fiber drums containing 25, 50, 100, or 250 pounds. If you'd like to see one-pound samples, just ask us on your company letterhead, specifying the sizes you want.

HOOKER ELECTROCHEMICAL COMPANY
102 Union Street, Niagara Falls, N. Y.
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HOOKER CHEMICALS PLASTICS

663W15

However, lately another type of meeting has gained in importance: preconvention symposiums to fill in executives in a specific field such as data processing. In addition, summer school classes for executives are now being held by a number of universities. These are generally costly affairs, running from $120 to $250 for a few days to $2500 or so for a few weeks. Instructors teaching such courses receive fair fees for their services, which is as it should be. It always seemed unfair to the writer, that this service should be put on the free list, hoping that the company or individual involved would put up the expense money for personal reputation or advertising gain. A definite trend is perceptible toward the use of high priced, concentrated programs for the busy executive, designed to assist him in keeping up with the rapid advance in technology. The detergent industry, would be well advised to look closely into this matter, and perhaps to form a concrete program integrated with those already available.

* * *

A PORTABLE, 3″ x 6″ x 2″ pH meter with carrying case and strap is available from Analytical Measurements, Inc., 585 Main Street, Chatham, N. J., at $125.00 each. The potassium chloride solution comes in plastic tubes. Accuracy claimed is plus or minus 0.1 pH, range 2 to 12 on the scale but adjustable to give reading from 0 to 14. This little instrument could be a valuable asset around a soap plant.

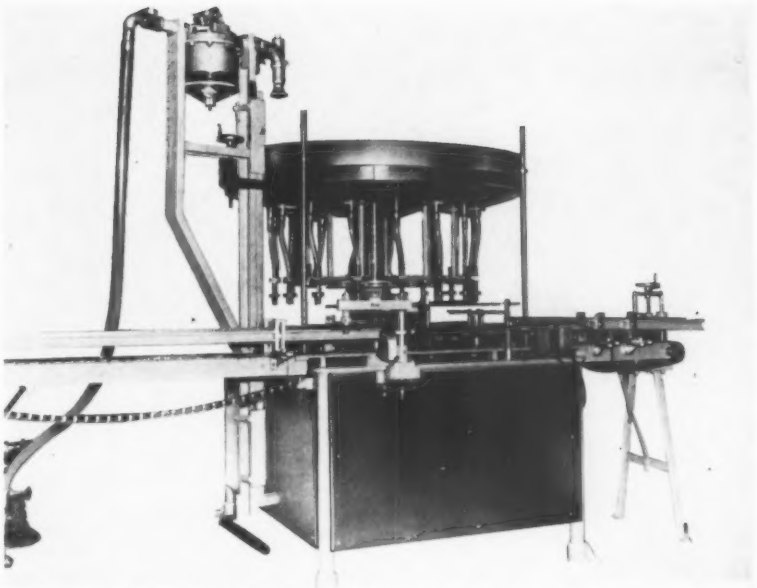
* * *

PALO LABORATORY SUPPLY CO., 81 Reade Street, New York, offers a complete line of plastic laboratory ware from jars, funnels and tubing down to spigots, stopcocks and hollow corks in its catalog No. E956. Other manufacturers of laboratory ware carry many of these items, but this is the best single catalog we have seen.

Another supplier of plastic ware, Imperial Brass Mfg. Co., 1200 W. Harrison Street, Chicago 7, Ill., handles a wide range of plastic pipe. Imperial carries molded duPont Zytel fitting in various small sizes such as ¼ inch to ½ inch for use either with plastic pipe or stainless or other pipe. These fittings can be used with plastic pipe or tubing also, and nylon or polyethylene tubing is available, in similar sizes. The advantages – easy to apply, vibration proof, lighter, less costly and usable at temperatures ranging from —70°F. to 250°F. and up to 500 psi.

* * *

FOR detergent tests, note should be made of the availability of soiled Indianhead muslin coded ACH #115 at $1.10 per yard from the American Conditioning House, Inc., 11-17 Melcher Street, Boston, Mass. This cloth has been on sale for the past several years. Testfabrics, 55 Van Dam Street, New York, also make and sell a series of soiled test cloths in yard rolls made from cotton, wool, acetate, viscose, nylon, silk, Orlon Dacron, Dynel and Acrilan.



New automatic filling machine designed to meter a predetermined amount of liquid material was introduced recently by MRM, Inc., New York.

New Automatic Filler

A new automatic filling machine, designed to meter a predetermined amount of liquid material, was introduced recently by MRM, Inc., New York. The new unit operates in the continuous rotary principle with 16 spouts capable of filling up to 60 containers per minute. A meter is mounted above the machine and is connected to the main supply tank. Each spout is connected to a nondrip filling nozzle which is tripped open when coming into contact with the container. The meter handles 25 pounds of material. All parts in contact with the material are of stainless steel. Further information is available on request to MRM, 191 Berry St., Brooklyn 11, N. Y.

★

H. F. Tiffin Dies

H. F. Tiffin, 54, general sales manager of the Kurly Kate Corp., Chicago manufacturer of metal scouring sponges, died Jan. 13 of a heart attack at his home in Evanston, Ill. He had been associated with Kurly Kate for many years.

Production Clinic

(*From Page* 165)

besides the stationary units, are those for tiering, racks with removable casters and collapsible pallet storage racks.

DO YOUR SYNTHETIC DETERGENTS CONTAIN ENOUGH SILICATE *to protect these?*

When you use PQ silicates in your detergent slurries, you protect your equipment against corrosion. Just as important, you add the sales advantage of protecting consumer's tableware, appliances and kitchen equipment.

PQ silicate is indeed your complete builder. It performs efficiently and economically the five features of detergency—emulsification, saponification, deflocculation, suspension and prevention of re-deposition of dirt.

PQ silicates have held a major place in detergency for 100 years, first in soaps and now in synthetic detergents. Call us for more information. Our technicians will be pleased to discuss how PQ Silicates can help you.

METSO PQ

PQ SILICATE OF SODA

METSO DETERGENTS

PHILADELPHIA QUARTZ COMPANY

1152 Public Ledger Building, Philadelphia 6, Pa.

Associates: *Philadelphia Quartz Co. of Calif. Berkeley & Los Angeles, Calif., Tacoma, Wash.; National Silicates Limited, Toronto, Canada*
Distributors in over 65 cities

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PQ WORKS: ANDERSON, IND., BALTIMORE, MD., BUFFALO, N. Y. CHESTER, PA., JEFFERSONVILLE, IND., KANSAS CITY, KANS., RAHWAY, N. J., ST. LOUIS, MO., UTICA, ILL.

News...

PEOPLE • PRODUCTS • PLANTS

Dr. R. C. Roark Retires

* * *

Seeland Penick Vice-pres.

* * *

McElroy SR's Man of Year

* * *

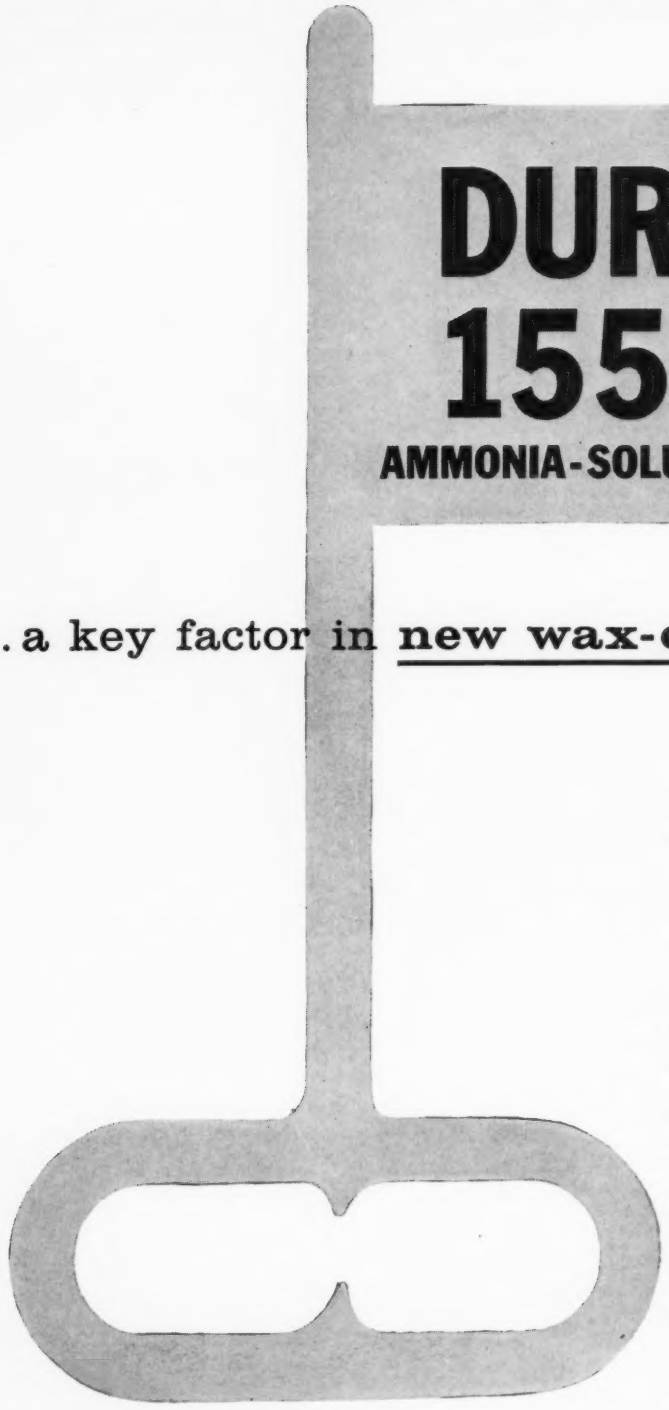
Sterling Acquires D-Con

New "High Lustre" self-polishing floor wax of Electrolux Corp., New York, is claimed not to discolor light color floors. Said to be durable, it dries to a hard, flexible transparent film that does not powder off. Maintenance is by damp mopping. Can be buffed to new high lustre. Product will be distributed through firm's own sales organization. Comes in gallon cans by Eastern Can Co., Brooklyn, to retail for $4.00.

DUREZ 15546

AMMONIA-SOLUBLE RESIN

...a key factor in new wax-emulsion polishes



The expanding use of polyethylene, polymers, and synthetic and modified waxes in formulating emulsion floor polishes focuses attention on ammonia-soluble-type resins.

One Durez resin in particular has proved to be of outstanding usefulness in these developments. This is Durez 15546, a resin that is added to the wax-resin emulsion to impart hardness, gloss, levelling, stability, and water-resistance to the finished product.

"15546" dissolves readily in ammonium hydroxide, morpholine, diethylethanolamine, 2-animo 2-methyl 1-propanol, and other amines. Any of these can be used to form stable solutions readily compatible with currently used materials of the type mentioned above.

Whether you are interested in producing improved polishes of high-gloss, non-scuff household types or high-gloss industrial types, investigation of Durez 15546 resin can pay you big dividends. Remember that inclusion of Durez resins in any formulation acts as a cost control factor in the finished product; being synthetic materials these resins are free from the wide price fluctuations of natural materials.

Order a trial shipment of "15546" today... and feel free to call on our wide experience with resins of this type.

DUREZ®

Phenolic Resins that Fit the Job

DUREZ PLASTICS DIVISION

HOOKER ELECTROCHEMICAL COMPANY

402 WALCK ROAD, NORTH TONAWANDA, N. Y.

Export Agent: Omni Products Corp., 460 Fourth Avenue, New York 16, New York

HOOKER CHEMICALS PLASTICS

News

Sterling Buys d-Con Co.

Acquisition of d-Con Co., Chicago, manufacturer of rodenticides, by Sterling Drug, Inc., New

Frank A. Corbet

York, was announced recently by James Hill, Jr., chairman of the board of Sterling. The transaction involved the purchase of d-Con's inventory of finished products. Sterling has dissolved and reorganized the firm under the same name and plans to move the d-Con executive and sales offices to its own headquarters at 1450 Broadway, New York, sometime in the Spring.

Frank A. Corbet, a divisional vice-president of Sterling's National Brands Division, has been elected president of d-Con. Jerome S. Garland, former president of d-Con, will assist Mr. Corbet in a consulting capacity. Sterling will manufacture the d-Con line of rodenticides at a plant now under construction in Alliance, O. Pending the start of plant operations there this June, production will continue at the present d-Con plant in Chicago.

—★—

Detergent Business Sold

Re-Mark Chemical Co., Miami, Fla., fertilizer manufacturers, are completing plans to take over Tremm Chemical Corp., North Miami, manufacturers of detergents, liquid starch, ammonia and related products. Tremm, established a year ago by William C. Webb, occupies an acre and a half and a 20,000 sq. ft. plant in the growing North Miami industrial district. David Marks, president of Re-Mark, expected to complete the acquisition about Feb. 1. Re-Mark operates plants in Hallandale, Goulds and Belle Glade, also a distributing subsidiary in Cuba.

—★—

Buffington in New Post

J. M. Buffington has been named manager of the northern California sales division of Los Angeles Soap Co. and White King Soap Co., Los Angeles, it was announced recently. Mr. Buffington will headquarter in San Francisco. He succeeds J. Murray Hall, who has been named manager of the firm's northwest sales division in Seattle.

—★—

Lever Appoints Lewis

Appointment of Stanley Lewis as product manager in the Lever Division of Lever Brothers Co., New York, was announced recently. In his new post, Mr. Lewis will handle "Hum," a new controlled-suds liquid detergent now being test marketed. Mr. Lewis was formerly vice-president and general sales manager of Bon Ami Co., New York.

Stanley Lewis

Diversey Appoints Perry

R. C. Perry has been named general sales manager of Diversey Corp., Chicago, it was announced

R. C. Perry

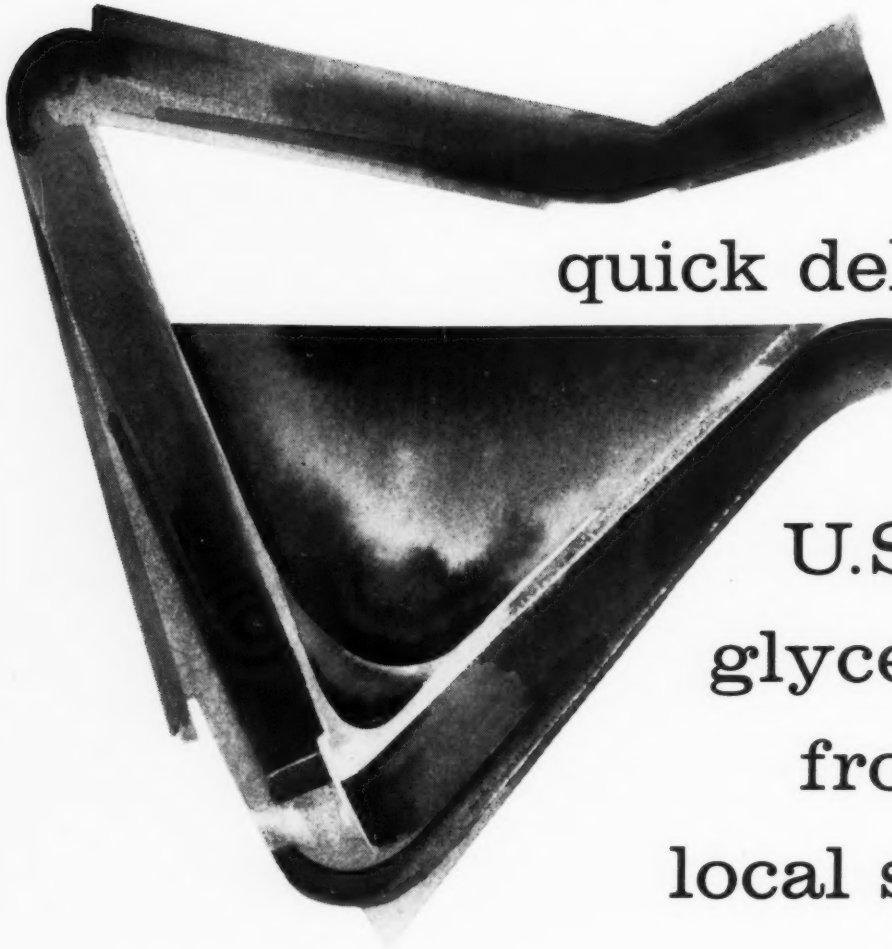
recently by H. W. Kochs, board chairman. Mr. Perry succeeds B. B. Button, who has been named vice-president of sales. Mr. Perry formerly was Pacific division sales manager. He has been with the company for 15 years.

Other executive sales appointments recently announced by Diversey include J. M. Sharp, eastern regional manager; J. K. Bradford, Jr., southern regional manager; J. R. McBrien, Pacific regional manager; F. G. Morgan, southern Pacific division manager; Frank Berus, northern Pacific division manager; R. C. Cheek, north central division manager; W. D. Funston, Pacific northwest district manager; Sam K. Smith, San Francisco district manager; J. T. Hardy, Philadelphia district manager; and Perry Edman, Omaha district manager.

—★—

New Tamms Warehouse

Tamms Industries, Inc., Chicago, has moved its warehouse in that city to a building at 2035 West 58th St., it was announced recently. The firm's former warehouse, at 8124 South Hoyne Ave., was destroyed by fire on Jan. 15.



quick delivery

U.S.P. glycerine from local stocks

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Dr. R. C. Roark Retires from U.S.D.A.

RURIC Creegan Roark, for nearly 30 years head of the Pesticide Chemicals Research Section of the Entomology Branch, and its predecessors in the U. S. Department of Agriculture, has retired from Government service, effective Dec. 1. He is succeeded in this position by Stanley A. Hall, formerly leader of the Branch's project on synthesis of organic insecticides, synergists, and insect repellents and attractants.

Dr. Roark has authored about 200 publications pertaining to the chemistry and economics of insecticides and has been granted 10 U. S. patents on new insecticides. He joined the Insecticide and Fungicide Laboratory of USDA's former Bureau of Chemistry in 1908, where he assisted in the development of analytical methods for numerous insecticides, fungicides and disinfectants which the Insecticide Act of 1910 placed under Federal control.

In 1918 Dr. Roark left USDA for private employment with the United States Sanitary Specialties Corp. and General Chemical Co. He returned to government service in 1923. In cooperation with R. T. Cotton, USDA entomologist, Dr. Roark developed and patented a number of new fumigants including ethylene oxide, an ethylene dichloride/carbon tetrachloride mixture, propylene chloride, and ethyl formate. Dr. Roark and Dr. Cotton were presented in 1940 with a Modern Pioneer Award by the National Association of Manufacturers for this accomplishment.

When the Insecticide Division of USDA's former Bureau of Chemistry and Soils was established in July 1927, Dr. Roark was appointed chief. This division was transferred to the Bureau of Entomology and Plant Quarantine in 1934, and in 1954 it became the Pesticide Chemicals Research Section of the Entomology Research Branch, Agricultural Research Service. USDA presented a distinguished service award to Dr. Roark's unit

Dr. R. C. Roark

in 1948 and in 1956 Dr. Roark was honored personally with USDA's superior service award for "inspirational leadership and meritorious service to agriculture in developing and improving the use of chemical control methods for insect pests."

In addition, Dr. Roark was responsible also for chemical research on insect control materials important to national defense. In 1946 the Surgeon General of the Navy commended him and his staff for exceptionally meritorious service rendered to naval forces throughout the world during World War II.

Dr. Roark played a major part in the development and adoption of rotenone containing insecticides derived from derris, cube, and related plants. He pioneered in the search for synthetic organic compounds to replace the toxic arsenicals which formerly were the chief insecticides. His unit helped to establish the manufacture of DDT in the United States during World War II, and he has been a leader in recognizing the need for study of residues left on crops.

Stanley A. Hall, successor to Dr. Roark, joined the Department of Agriculture in 1939 after his graduation from the Polytechnic Institute of Brooklyn. He also holds a degree from Columbia University's School of Engineering. His first assignment was in the Naval Stores Division of the former Bureau of Agricultural Chemistry and Engineering. In 1943 he transferred to the Bureau of Entomology and Plant Quarantine to conduct chemical research on insecticides and repellents, particularly those of interest to the armed forces. From March 1955 until his recent appointment as section head he was in charge of the Entomology Branch's project on synthesis of organic compounds for testing insecticides, synergists, and insect repellents and attractants.

—★—

Weiss Joins Alcolac

American Alcolac Corp., Baltimore, recently announced that Herbert Weiss has joined its commercial research laboratory as a research chemist.

—★—

Jack Hirsch Dies

Jack D. Hirsch, 40, president and founder of Formula Floor Products, Inc., Newark, N. J., died Jan. 17 of a heart attack while on vacation in Marathon, Fla., midway between Miami and Key West. Funeral services were held Jan. 20 at Temple Israel, Maplewood, N.J., and burial followed in Beth Israel Cemetery, Woodbridge, N. J.

Surviving are his wife, Mrs. Winifred Brooks Hirsch; two sons, Brooks and Ralph; his parents, Louis Hirsch of Albany, N. Y., and Mrs. Rachel Hirsch of Philadelphia; two brothers, Harry of Detroit and Maury of Atherton, Calif., and a sister, Mrs. Billie Friedberg of Atlantic City, N. J.

Since 1945 when Mr. Hirsch founded Formula Floor Products, the firm has grown steadily into one of the nation's largest sanitary supply houses with annual volume in excess of one million dollars. For the past two and one-half years Formula has occupied a plant at 99 Frelinghuysen Ave., Newark. with more than 42,000 square feet of floor area. Formula branches are located in Trenton, Bridgeport, New York and Philadelphia.

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Penick Elects Seeland

Frank Seeland has been elected vice-president of S. B. Penick & Co., New York, it was announced last month by S. B. Penick, Jr., president. Mr. Seeland left Prentiss Drug & Chemical Co., New York, to join Penick in 1952. In January, 1955 he was named manager of the firm's agricultural chemical and insecticide division, succeeding Harold Noble, who retired. Mr. Seeland has been in the insecticide field for more than 12 years and has helped introduce materials such as malathion, lindane, etc.

Frank Seeland

—★—

New Boyle-Midway Plant

Boyle-Midway, Inc., New York, recently announced construction of a new plant on a 25 acre site in Bedford Park, Ill. The one-story plant will contain 288,000 square feet of floor space. The company manufactures waxes, lubricating oil and other related specialties.

—★—

William N. Huse Dies

William N. Huse, 45, vice-president in charge of sales and marketing of Bon Ami Co., New York, died Jan. 16 in Greenwich Hospital, Greenwich, Conn., after an illness of seven months.

A graduate of Dartmouth University in 1932, Mr. Huse started his business career as brand manager of Procter & Gamble Co. in Cincinnati. Later he was advertising manager of the Albert Milling Co. and vice-president of Dancer-Fitzgerald-Sample advertising agency. He was named to the Bon Ami post Jan. 1, 1956.

—★—

Wrisley Honors Seven

A plant-wide celebration was held recently at Allen B. Wrisley Co., Chicago, in tribute to seven employees who have been with the firm for 40 or more years. Those honored received engraved gold watches from Wrisley B. Oleson, president. Employees honored included Hattie Adler, Ida Miller, Joseph Perelli, Nick Cariola, Luigi Mutalipassi, Vito Porcelli and George Voss.

—★—

C. H. Bollinger Retires

Clifford H. Bollinger, chief chemist of Furst-McNess Co., Freeport, Ill., recently announced his retirement from active service. Mr. Bollinger, who has been associated with Furst-McNess for 29 years, will be retained on a part time basis as a special consultant.

—★—

Polak's Sales Meeting

The annual sales meeting of Polak's Frutal Works, Middletown, N. Y., was held at the company's plant in that city, Dec. 10-12. All representatives of Polak's in the United States and Canada, attended the conferences. Highlight of the three-day meeting was a dinner party at the Orange County Golf Club for executive, sales and technical personnel and their ladies.

Turco Advances Newman

Appointment of Kenneth W. Newman as chief processing engineer, was announced recently by Turco Products, Inc., Los Angeles. In his new assignment, Dr. Newman will supervise the reorganization of the firm's process division. Dr. Newman formerly was director of research. He joined Turco in 1953 as a process engineer.

Kenneth W. Newman

—★—

Mrs. Arthur L. Fox Dies

Mrs. Vera Blacker Fox, wife of Dr. Arthur L. Fox, industrial research director of Colgate-Palmolive Co., New York, died Jan. 29, at her Short Hills, N. J., home. She was 58 years old. Besides her husband, she leaves two sons, Kenneth E. and William A. Fox, and her mother, Mrs. Allie Blacker.

West Moves in Detroit

West Disinfecting Co., Long Island City, N. Y., has moved its Detroit sales office and warehouse to a new, modern one-story building at 11201 Manning Ave., it was announced recently by J. K. Rowley, Detroit sales manager. The branch was formerly located at 27-60 Third Ave. The new warehouse contains approximately 15,000 square feet of storage space and is equipped with loading platforms and rail sidings.

New Detroit sales office and warehouse of West Disinfecting Co.

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Removing the grit and grime from a well-traveled automobile requires a cleaner with muscles. Leading synthetic detergents compounded with Atlantic Ultrawets can be made rugged enough to leave a clean, streakless shine on cars and locomotives, gentle enough for feminine hands and the finest fabrics. This is so because each of the Ultrawets has been specifically designed to do its cleaning job better.

The Ultrawets are only one member of the Atlantic family of petrochemicals (so you see a miniature oil refinery in the picture). Many new and profitable uses for these versatile Atlantic petrochemicals are constantly being applied in cost-cutting processes, in the development of new products and the improvement of well-established brands. For further information on Atlantic petrochemicals and service, write or wire The Atlantic Refining Company, Dept. E-2, at the nearest office listed below.

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In Canada: Naugatuck Chemicals Division of Dominion Rubber Company, Ltd.

In Europe: Atlantic Chemicals SAB, Antwerp, Belgium

In South America: Atlantic Refining Company of Brazil, Rio de Janeiro

D-12 Committee Meeting

The 1957 annual meeting of Committee D-12 on Soaps and other Detergents of the American Society for Testing Materials will be held on Mar. 11th and 12th at the Hotel Park Sheraton, New York, according to a recent announcement by J. C. Harris, Monsanto Chemical Co., Dayton, O., chairman, and E. W. Colt, Armour and Co., Chicago, secretary. The program for the regular committee activities and technical papers is now being prepared and will be mailed to members about Feb. 15.

★

New Monsanto, Emery Plant

Monsanto Chemical Co., St. Louis, and Emery Industries, Inc., Cincinnati, will build a $4,000,000 plant at Nitro, W. Va., for the production of resinous chemicals from crude tall oils, it was announced jointly by the two concerns recently.

St. Regis Paper Co., New York, will be closely identified with the project as a supplier of crude tall oils obtained from its sulfate pulp mill operations. The tall oils will be sent by barge to Nitro from St. Regis mills in Florida. The plant will be built as a joint venture of Monsanto and Emery.

★

Lehn & Fink Names Two

Election of Paul Carey and James M. Boohecker as vice-presidents of Lehn & Fink Products Corp., New York, was announced recently by Edward Plaut, president. Both men are members of the board of directors and general managers of Lehn & Fink subsidiaries.

Paul Carey

Mr. Carey, general manager of Tussy Cosmetiques, New York, joined Lehn & Fink in 1931 as a sales trainee. He became assistant sales manager of Tussy in 1936; sales manager in 1940; and general manager in 1946. Mr. Boohecker, general manager of Dorothy Gray, Ltd., New York, joined the sales department of Lehn & Fink in 1936. He was named sales manager for Dorothy Gray in 1943 and became general manager in 1955.

James M. Boohecker

McElroy Honored by SR

Neil H. McElroy, president of Procter & Gamble Co., Cincinnati, has been named "Business-man of the Year" by the *Saturday Review*, according to a story in that publication's issue of Jan. 19. The magazine awards its annual citation to the executive who has measured up best to the new image of the business-citizen.

According to the article, the editors of *Saturday Review* chose Mr. McElroy because of his impressive record as chief executive of Procter & Gamble and because of the substantial amount of time and energy he has devoted to a broad range of public service projects, principally in the field of education. The editors were guided in their choice by a representative panel of educators, editors and executives. The panel members chose Mr. McElroy from among 14 nominees.

Roy Hagelin

Hagelin Joins Ungerer

Roy Hagelin has joined Ungerer & Co., New York, as sales manager, it was announced recently by Kenneth G. Voorhees, president. Mr. Hagelin has been associated with the essential oil industry for more than 25 years. He most recently served with Sunkist Growers, Inc., Ontario, Calif., as supervisor of citrus oils sales. He will headquarter at Ungerer's main office in New York.

★

Refined Appoints Damon

A. Durfee Damon has been appointed Hudson Valley, N. Y., technical sales representative of Refined Products Corp., Lyndhurst, N. J., it was announced recently. Mr. Damon formerly was associated with Deering, Milliken, Inc., where he was employed in various technical capacities, including foreman of the bleaching department, chief chemist and general manager.

★

Diamond Appoints Clayton

Appointment of Bernard Clayton as western district sales manager of Diamond Black Leaf Co., Cleveland, was announced recently by George V. Dupont, general manager. Mr. Clayton will headquarter at the company's San Jose, Calif., branch. Mr. Clayton joined Diamond in 1955 and since that time has been assigned to the Waco., Tex., sales office. He previously had served with the former Black Leaf Division of Virginia-Carolina Chemical Corp., Richmond, Va.

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Fry Joins Hollingshead

Ray D. Fry has joined R. M. Hollingshead Corp., Camden, N. J., as sales representative, it was

Ray D. Fry

announced recently by Reid W. Malcolm, Jr., sales manager. Mr. Fry will handle the firm's line of maintenance and sanitation products in Ohio, West Virginia, western Pennsylvania, four western counties of New York state, and Detroit. Mr. Fry previously had served with Procter & Gamble Co., Cincinnati, as a research analyst, and with Great Western Oil Co., Cleveland, as sales manager.

—★—

New CMRA Meeting Dates

The Philadelphia meeting of the Chemical Market Research Association, scheduled to be held at the Sheraton Hotel, Philadelphia, Feb. 19-20, has been postponed until Mar. 12-13, it was announced recently. There is no change in location. The theme of the meeting will be "Our Next Five Years of Competition with Foreign Chemical Industry." J. Ralph Macon, Atlantic Refining Co., Philadelphia, is general chairman.

—★—

Jenni Forms New Firm

Formation of H. W. Jenni Sales Co., 2 Ninth St., Des Moines, Ia., was announced recently by H. W. Jenni, founder and owner of the new firm. Mr. Jenni formerly was associated with Hy-Grade Food Products Co., as western sales manager of the soap division, and with National Soap and Refining Co., as sales manager. The company will act as sales agent for companies in and around the Des Moines area.

—★—

New Protective Coating

A new protective coating for use on buildings and equipment in chemical plants and refineries, was introduced recently by West Chester Chemical Co., West Chester, Pa. Tradenamed "Maintz," the product is claimed to be resistant to oxidation, weathering, nitric and chromic acids, chlorine solutions, refrigerants, alcohols, ethers and many other chemicals and solvents. It is based on "Hypalon," du Pont's chlorosulfonated polyethylene, and is available in 55 gallon drums and one and five gallon containers. "Maintz" comes in white, black, gray and a variety of pastel colors. Further information can be obtained from the company, Box 39, West Chester, Pa.

—★—

Armour Advances Hoerner

John M. Hoerner has been appointed assistant general manager of the auxiliaries group of Armour and Co., Chicago, it was announced last month by F. B. Patton, vice-president and general manager. Mr. Hoerner was formerly general manager of the company's chemical division. He is succeeded in that post by Edward A. Coons.

Mr. Hoerner joined Armour in 1953 as director of purchases and sales of the chemical division and became division manager in June, 1955. He was previously associated with Atlantic Refining Co., Philadelphia.

John M. Hoerner

Modern Sets Production

Modern Sales Co., New Orleans manufacturer of sanitary chemicals, will begin production

Mark Kay

shortly of cleaners, waxes, deodorants, bowl cleaners and insecticides, it was announced recently by Mark Kay, vice-president in charge of sales.

The company began operations several weeks ago and now is granting distributorships to selected sanitary supply jobbers throughout the nation, according to Mr. Kay. Modern plans to work closely with its distributors and will hold sales meetings for jobber personnel, clinics for jobber customers and will help to train jobber sales personnel in the field.

Full information regarding the firm's products and available distributorships may be obtained on request to Modern Sales Co., 511 Lafayette St., New Orleans 12, La.

—★—

Foster D. Snell Expands

Asquisition of Seil, Putt & Rusby, New York chemical consultants, by Foster D. Snell, Inc., New York, was announced recently by Foster Dee Snell, president and board chairman.

Stephen S. Voris, president of Seil, will continue to head the firm which will be operated as a subsidiary. No other personnel changes are contemplated. Seil specialized in the analysis of organic insecticides, pyrethrum flowers, soaps, essential oils, barbasco, derris and cube roots.

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New Atlas Research Bldg.

Atlas Powder Co., Wilmington, Del., recently announced construction of a $3,000,000 technical center. The new structure will be located adjacent to the company's general offices in Wilmington. It is scheduled for completion by the end of the year. The technical center will provide facilities for research and development work on Atlas' complete line of products. Technical studies and product development activities now being carried out at the firm's central research laboratory at Atlas Point, Del., will be transferred to the new building. It will also house personnel of the research and product development department who are now located in the general offices. The building is designed to provide working space for 200 employees.

—★—

Baird & McGuire Expands

Baird & McGuire, Inc., Holbrook, Mass., recently announced an expansion of its shipping and receiving facilities at its Holbrook plant. According to G. M. Baird, president, the expansion will include construction of a fireproof building that will permit the loading and receiving of eight additional freight cars. The new structure is scheduled for completion during the first week in April.

—★—

ESA Meets, Elects Armitage

H. M. Armitage, California Department of Agriculture, was elected president of the Entomological Society of America for 1957 during the group's fourth annual meeting held recently at the Hotel New Yorker, New York. Mr. Armitage succeeds B. A. Porter, U. S. Department of Agriculture.

The program included two invitational papers on the biological control of insects and a series of reports on the results of recent test work on chemical control materials and methods.

C. G. Thompson of the Entomology Research Branch, USDA, Beltsville, Md., spoke on "The Role of Insect Pathology in Biological Control," while P. B. Dowden, Northeastern Forest Experiment Station, New Haven, Conn., discussed "Biological Control of Forest Insects."

The committee on chemical control investigations, of which C. C. Alexander, Geigy Chemicals Co., Ardsley, N. Y., is chairman, heard a discussion on the use of ryania for the control of the codling moth and other apple pests by M. L. Cleveland and D. W. Hamilton of the Entomolgy Research Branch, Vincennes, Ind.

Other officers elected included Robert Metcalf, president-elect and R. H. Nelson, who was renamed as secretary. The society also announced that the 1957 meeting will be held in Memphis, Tenn., in late November.

—★—

FMC Appoints Two

Robert J. DeLargey, manager of the South Charleston, W. Va., Westvaco chlor-alkali plant of Food Machinery and Chemical Corp., New York, has been named director of engineering for FMC's chemical divisions, it was announced recently by Carl F. Prutton, executive vice-president of FMC. Mr. DeLargey will be succeeded at South Charleston by Neil C. Elphick, general superintendent of the plant.

In his new post, Mr. DeLargey will be responsible for plant design and construction, process development, and industrial engineering for all the chemical divisions including Westvaco Chlor-Alkali Division. Prior to becoming plant manager at South Charleston, Mr. DeLargey served as production manager and director of engineering for the Westvaco organization.

—★—

New Alco Folder

Alco Oil and Chemical Corp., Philadelphia, recently issued a new two-color, eight-page booklet describing its line of stabilizers, thickeners, wetting agents, softeners and chemicals used in formulation of protective coatings. Copies of the booklet are available on request to the company, Trenton Ave. and William St., Philadelphia 34.

Architect's drawing of new Atlas Powder Co. research center.

Robert J. DeLargey

Neil C. Elphick

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Fly and Roach Repellent

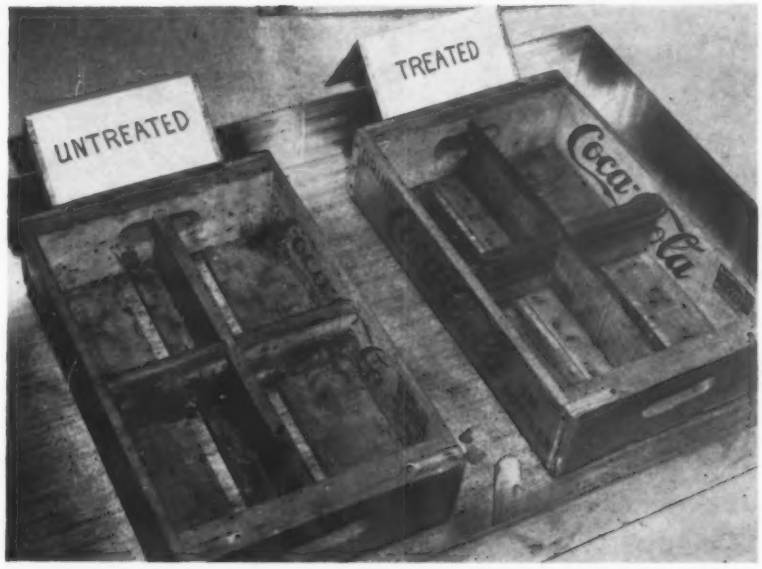
"Tabutrex," a new insect repellent, has been granted an experimental permit by the U.S. Department of Agriculture, it was announced last month by Consolidated Research and Testing Laboratories, Chicago. Originally developed for use as a fly repellent on livestock, the product exhibits a broad spectrum of repellency against a range of crawling and flying insects. Described as a colorless liquid derivative of an organic acid, the material is said to combine long residual life with low mammalian toxicity.

On livestock, "Tabutrex" formulations are said to be repellent even to the stable fly which resists most control measures. It is equally effective in protecting the animal against other livestock pests. In food plants the material has been applied to brick and wood surfaces around loading docks and doors as an effective repellent against flies already in the area and to reduce the number of flies entering the plant. A calf barn remained free from flies five days from the application of the repellent. None of these tests involved the use of toxicants.

Good promise is shown by "Tabutrex" against roaches. When applied on wooden beverage cases it showed good repellency against German and American roaches for 15 weeks.

On an unpainted metal surface 100 percent repellency was maintained for nine days; after 16 days repellency was still found to be 80 percent. On wooden surfaces in an infested boiler room 95 to 100 percent repellency prevailed for 31 days. A formulation of "Tabutrex" and pyrethrins remained 100 percent effective for 31 days.

The repellent is used at concentrations ranging from one to five percent and work is currently in progress to determine if even lower concentrations are practical. The product may be applied by pressure spray or by topical means such as a sponge or cloth. Experimental formulations of "Tabutrex" include oil base sprays with or without activated pyrethrins; a fogging formula incorporating pyrethrins and an emulsifiable concentrate, without toxicant.



Graphic demonstration of repellency on beverage case. Repellency is said to have continued effective for about 15 weeks.

The material is available for experimental use also in pressure packaged form. It comes in 12 ounce aerosol cans both with or without activated pyrethrins. In this form "Tabutrex" has been used as a space spray to drive flying insects from rooms and other enclosed areas. The aerosol has also been successfully tried by agencies servicing vending machines to prevent aggregations of roaches under the equipment.

Use of repellents such as "Tabutrex" answers the insect problem where pests have acquired resistance to insecticides or where the presence of dead or dying insects is highly undesirable as for instance in food plants, food handling establishments, dairies, etc.

Toxicity testing of the material was carried out by the Wisconsin Alumni Research Foundation and showed acute oral LD 50 on rats of about 8,000 mg./kg. Ninety-day subacute oral toxicity tests indicated no injury to laboratory animals. Skin irritation, eye irritation and inhalation tests all produced negative results. A 21-day test in which the test animal was treated daily with "Tabutrex" failed to show the chemical in the milk at any time. The assay method employed in this milk test is sensitive to one part in 10 million.

Entomological investigations pertaining to the repellent have in large part been conducted by W. N. Bruce, associate entomologist, Illinois Natural History Survey, Champaign. Full information on "Tabutrex" is available from the manufacturer, Consolidated Research and Testing Laboratories, 2735 North Ashland Avenue, Chicago 14.

—★—

In New Pennsalt Post

George R. Lawson has been appointed director of marketing of the industrial division of Pennsylvania Salt Manufacturing Co., Philadelphia, it was announced recently by Hugh C. Land, general manager. In his new post, Mr. Lawson will direct the combined sales organizations of the former Sharples and industrial chemicals divisions which were recently consolidated in the formation of the industrial division. Mr. Lawson joined Pennsalt in 1946 and served successively in the Sharples division as manager of its New York office, general manager of sales and vice-president in charge of sales.

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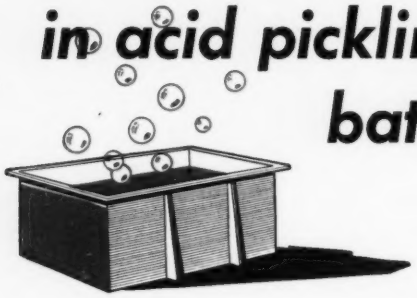
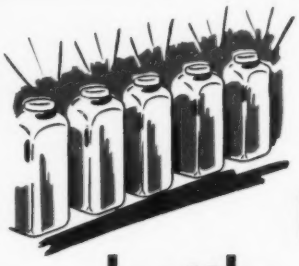
Busting Bubbles *in acid pickling baths*



In many metal-working plants, acid pickling baths are used to remove scale or oxide film from metals before finishing, plating or forming. These baths are from 5 to 10% sulfuric acid. During pickling, hydrogen gas bubbles accumulate on the metal surfaces and reduce the cleaning action.

You can make a good "pickling assistant" with RENEX detergents. These materials have superior wetting action that releases the hydrogen bubbles from the metal surface as they form, and thus speed up and increase coverage and penetration of the cleaning bath. RENEX detergents are stable in acids.

Especially suitable for this job are RENEX 688, 690 and 698. Write to us for samples and technical facts.



Putting punch in bottle washing

Milk, soft drink and beer bottles are cleaned in mechanical bottle washers, in which the job of loosening soil is done in soak or spray tanks containing caustic soda solution. The caustic can't do the whole job; it needs a lift from a good synthetic detergent, like you'll find in the RENEX series, to get quick, efficient penetration of dried soil and thorough draining from the bottles, with minimum foaming.

Several of the RENEX materials listed below are excellent for this use, particularly RENEX 688, 690 and 698. They're used at levels of about 3 ounces for every 100 gallons of wash. Or, if you figure on the basis of bottles, recommend 2 to 3 ounces of RENEX detergent for 5,000 bottles through the washer.

We'll be glad to send samples and product information sheets.

Formulate to fit your needs with the RENEX 600 detergent family

RENEX No.	648	697	688	698	690	678	650
Mols ETO	5	6	8	9–9.5	10	15	30
Form @ 25° C.	liquid	liquid	liquid	liquid	liquid	liquid	solid
HLB No.	10	10.9	12.3	13	13.3	15	17.1
Wetting @ 25° C. (% soln. req. for 25 sec. wet)		.1 .2	.06 .08	.05 .07	.05 .07	.3 .5	>1
Foam height (Ross-Miles, mm .05% soln. @ 25° C.)	11	11	17	26	40	83	71
Cloud Point °F.	—	<32	87	129	150	211	>212
Water solubility *	I	D	D	S	S	S	S

* I—insoluble
D—dispersible
S—soluble

NOTE: These data represent typical characteristics rather than guaranteed specifications.

Deegan in New Post

Martin I. Deegan has been named head of the wax shipping department of Moore & Munger,

Martin I. Deegan

Inc., New York. Mr. Deegan succeeds Edward A. Deely, a partner and member of the firm for 47 years, who has retired. Mr. Deegan joined Moore & Munger in 1923. He formerly was assistant to Mr. Deely.

—★—

Thanks from France

The following letter from Societe Elekal, Paris, France, recently was received by Frederick G. Lodes, president of Lodes Aerosol Consultants, Inc., New York, and chairman of the Chemical Specialties Manufacturers Association's aerosol packaging committee. Elekal's "Bib" window cleaner won first prize in the miscellaneous household products classification in the 1956 Aerosol Package Contest.

"Dear Fred:

"It seems unnecessary to tell you that your letter of Nov. 21st gave us a great pleasure and has created a good deal of excitement among all the Elekal people.

"We did not expect that our efforts could result in such a reward and we are happy to see that the committee of which you are the chairman did not hesitate to honor a foreign firm.

"We believe this is evidence of the open-mindedness we often meet among our American friends and you can be convinced that it has made the reward much more valuable for us.

"By the same mail, we are asking Al Perry of Airkem, Inc., New York, if he could represent us, and we are certain that he will handle this office better than anyone of us.

"We only regret that we are not able to meet our American colleagues with whom we are acquainted, as well as those we would like to know.

"Nevertheless, I hope this opportunity will arise again because we in France will never forget the pioneer work which has been done in this field in the States, and the advantages we gained therefrom.

"Paul Appell
Societe Elekal
Paris, France"

—★—

Aerogon Appoints New Rep.

Natural Products Corporation, Montreal, has been appointed exclusive sales representatives in Canada, for the wax line of Aerogon Chemical Industries, Inc., New York, it was announced recently by Kurt J. Wasserman, general manager of Aerogon. Aerogon manufactures "Aerok" synthetic polymer waxes and "Microgon" oxidized petroleum waxes.

Davies NB&W Rep.

Earl E. Davies has been appointed west coast representative of Neumann-Buslee and Wolfe,

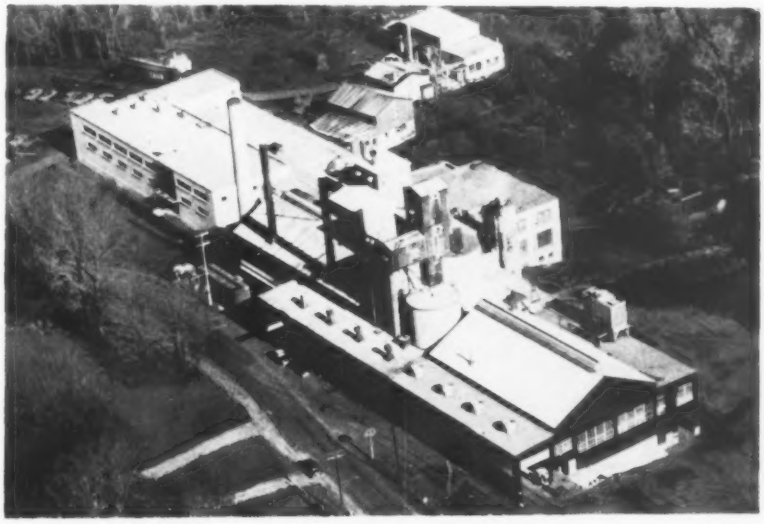
Earl E. Davies

Inc., Chicago, it was announced recently. Mr. Davies, who will handle the firm's entire line of essential oils and flavors, will headquarter in Pasadena, Calif. Mr. Davies formerly was middle west sales and technical representative for the National Aniline Division of Allied Chemical & Dye Corp., New York.

—★—

New Alcolac Alcohols

American Alcolac Corp., Baltimore, recently announced the addition of octyl and decyl alcohols to its line of fatty alcohols. It is expected that these products will find use in the manufacture of plasticizers, olefins and chemical intermediates.



New addition to Skaneateles Falls, N. Y., plant of Cowles Chemical Co. for production of potassium silicates, is shown in foreground. Industrial cleaning compounds, anhydrous sodium metasilicate and organic synthesis products are also made at plant. Plant office, engineering dept. and research labs are shown at extreme left.

Aromatic Products, Incorporated

Specialists in the creation of

PERFUME ODORS

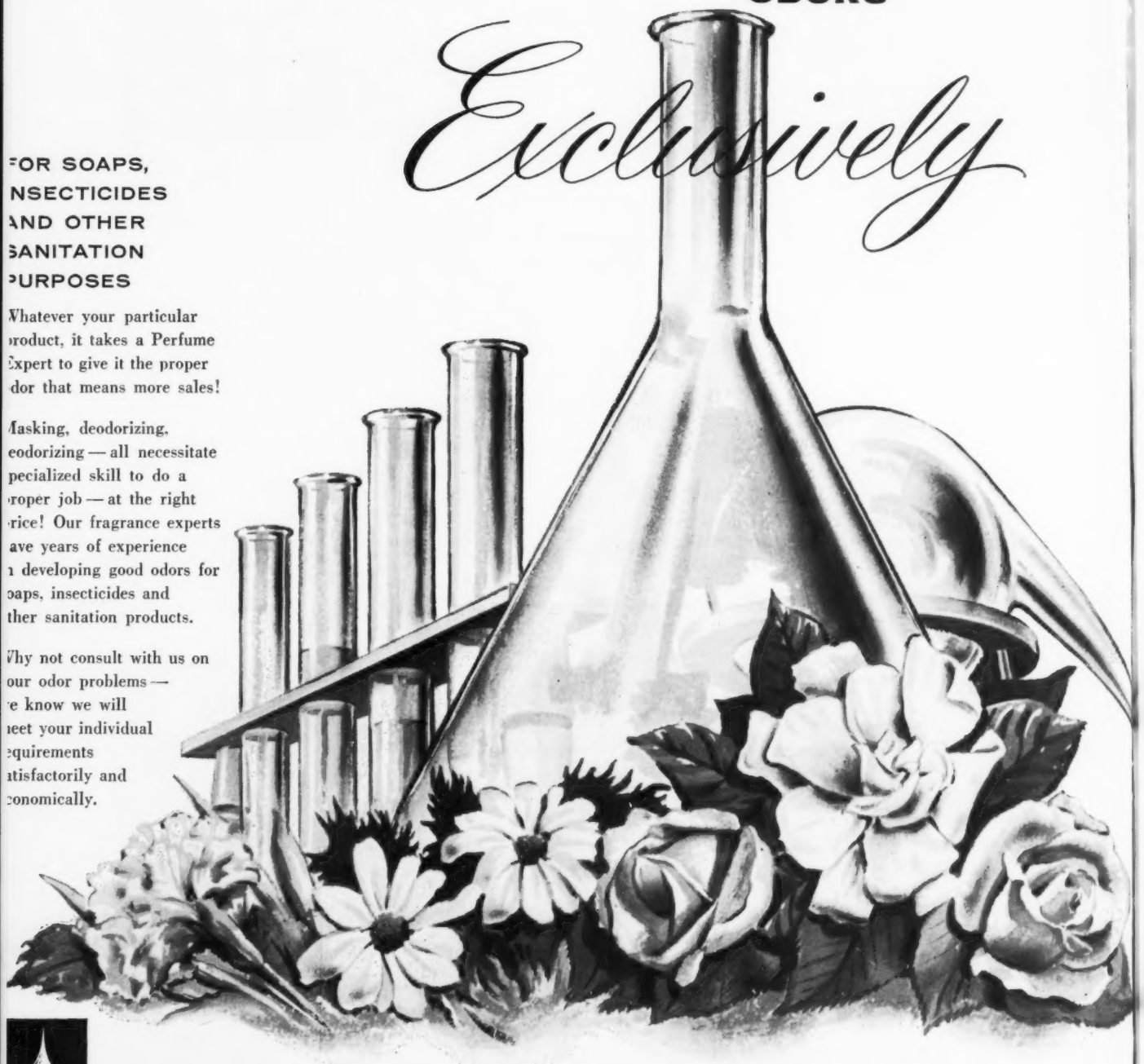
Exclusively

FOR SOAPS, INSECTICIDES AND OTHER SANITATION PURPOSES

Whatever your particular product, it takes a Perfume Expert to give it the proper odor that means more sales!

Masking, deodorizing, deodorizing — all necessitate specialized skill to do a proper job — at the right price! Our fragrance experts have years of experience in developing good odors for soaps, insecticides and other sanitation products.

Why not consult with us on your odor problems — we know we will meet your individual requirements satisfactorily and economically.



AROMATIC PRODUCTS, Incorporated · 235 FOURTH AVENUE · NEW YORK 3

CHICAGO · DALLAS · MEMPHIS · PITTSBURGH · LOS ANGELES · BOSTON · FORT LAUDERDALE

Becco Appoints Shutts

Albert P. Shutts has been named assistant sales manager of Becco Chemical Division of Food

Albert P. Shutts

Machinery and Chemical Corp., Buffalo, N.Y., it was announced recently by Frederick A. Gilbert, Becco president. For the past two years, Mr. Shutts had been New York district sales manager. He joined Becco in 1946 as a New York field representative.

—★—

Dragoco Execs. to Germany

C. H. Gerberding, president of Dragoco, Inc., New York, and vice-president of the German parent company, Dragoco-Holzminden, returned to Holzminden, Feb. 15. He had been in the United States since November, conferring with Dr. Henry G. Gribou, vice-president and general manager of the New York company, and making new contacts and renewing established relations with customers in the United States. On his trip to Germany, Mr. Gerberding is accompanied by Edward A. Bush, recently appointed sales manager of the New York firm. Mr. Bush, whose previous associations include Bush Aromatics, Inc., Dow Chemical Co., and Rhodia, Inc., will familiarize himself with the Holzminden organization and its products and methods.

Another visitor from Holzminden was Karl O. Weilinger, export manager, who recently left the United States for a six months trip covering South America. He will visit Latin America customers and seek new market outlets.

Dragoco recently introduced "Ambrofix" to its American customers. The product is described as a new perfume fixative of ambergris and musk tendency.

—★—

Mrs. John Breck Dies

Mrs. Elizabeth Pratt Breck, wife of John H. Breck, Sr., founder and board chairman of John H. Breck, Inc., Springfield, Mass., died at Mercy Hospital in that city on Jan. 5.

Besides her husband survivors include two sons, Edward J. and John H., Jr., president and vice-president respectively, of John H. Breck, Inc.; two daughters, Miss M. Constance Breck and Mrs. Marion Sullivan.

—★—

Lever Names Kitchell

Charles H. Kitchell has been appointed manager of the copy department of the promotion services division of Lever Brothers Co., New York, it was announced recently by John J. Doran, director. Mr. Kitchell, who has served in the copy department since 1951, will be in charge of promotional copy and materials developed for the company's brand products and marketing division.

—★—

Perfumers Elect Bouillette

Pierre Bouillette of Givaudan-Delawanna, Inc., was elected president of the American Society of Perfumers at the annual meeting held at the Advertising Club, New York, Jan. 16. Other officers chosen include August J. Schwindeman of Dodge & Olcott, Inc., who was named vice-president, and Christian F. Wright, van Ameringen-Haebler, Inc., a former president, who was elected chairman of the board. Oliver L. Marton, Shulton, Inc., and Edward D. Morgan, Jr., Lever Brothers Co., were renamed secretary and treasurer respectively.

Newly elected directors include Herbert Sommer, Prince Matchabelli, Inc., and J. Hilary Herchelroth, Cresp-Martineng Corp.

Wyandotte Names Forrest

James A. Forrest has been named senior salesman for the Michigan Alkali Division of Wyan-

James A. Forrest

dotte Chemicals Corp., Wyandotte, Mich., it was announced recently. In his new assignment, Mr. Forrest will cover all of New York state with the exception of the New York City metropolitan area. He previously had served as a salesman with Iselin-Jefferson, Inc., New York.

—★—

North Central ESA to Meet

The 12th annual meeting of the North Central Branch of the Entomological Society of America will be held at the Hotel Savery, Des Moines, Ia., Mar. 27-29. Highlights of the conference include addresses on "Systemic Insecticides for Control of Livestock Pests," by R. C. Bushland and Evolution of "Insect Flight," by L. E. Chadwick. A panel discussion, and a section program on insecticide residue problems will round out the meeting.

—★—

Mixing Equipment Changes

Three executive appointments were announced recently by Mixing Equipment Co., Rochester, N. Y. Lewis H. Mahoney has been advanced from assistant sales manager to director of technical sales, while James A. Mason has been named chief application engineer. Mr. Mason formerly was senior application engineer. He will be replaced in that position by Donald M. Rowe.

... about chemical specialties

MODERN CHEMICAL SPECIALTIES

by Milton A. Lesser

THIS 514 page book covers the formulation, manufacture, and use of polishes, cleansers, detergents, floor-care and leather-care products, textile products, and industrial, household and allied chemical specialties. Each of the 42 chapters covers a different specialty and includes raw material listings, manufacturing methods and formulas for that specialty. The manufacturer, marketer, chemist and production man will find this book indispensable for reference work when dealing with chemical specialties.

SANITARY CHEMICALS

by Leonard Schwarcz

A COMPLETELY revised 576 page book covering formulations, properties, testing, history and effective use of sanitary chemicals. Included in the book are chapters on bacteria and disease, principles of disinfection, disinfectants, deodorants, man versus insects, household and industrial insecticides, rodenticides, floor waxes and floor care, sweeping compounds, potash soaps, detergents and cleansers labeling and packaging laws and regulations. Full coverage of labeling with specimens are provided. This book is for every executive, salesman, plant man and chemist . . . written in plain understandable language.

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Enclosed is our check for $..... Please send the following book(s):
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..... Modern Chemical Specialties, Price $7.25 in U.S.A.; $7.75 elsewhere.

Company .....

Address .....

City ..... State.....

By .....

Armour Advances Shafer

W. S. Shafer has been appointed vice-president in charge of trade relations of Armour and Co.,

W. S. Shafer

Chicago, it was announced recently. Mr. Shafer formerly headed the advertising and sales promotion division. He will be replaced in that position by K. L. Skillin, general advertising manager.

★

Fragrance Symposium

"What's Ahead in Fragrance" will be the theme of the third annual symposium on fragrance to be held by the American Society of Perfumers at Essex House, New York, Mar. 20. The seven technical papers to be presented in the afternoon will be followed by a reception and buffet supper. An honorary membership in the society will be awarded to H. Gregory Thomas, president of Chanel, Inc. and former president of the Fragrance Foundation. The symposium committee includes Pierre Bouillette, Givaudan-Delawanna, Inc.; Camille Bourguet, American Aromatics, Inc.; Everett D. Kilmer, Lever Brothers Co.; Oliver Marton, Shulton, Inc.; Raoul Pantaleoni, Alpine Aromatics, Inc.; and Christian F. Wright, van Ameringen-Haebler, Inc. Committee chairman is Paul G. I. Lauffer, House of Tangee.

With H. D. Goulden, scientific director of the Toilet Goods Association, and Frazer V. Sinclair, publisher of *Beauty Fashion* and *Drug and Cosmetic Industry*, as moderators, the technical program includes the following presentations. "The Language and Indexing of Fragrance," by Mr. Bourguet; "The Future of Creative Synthesis," by Henry C. Saunders, Givaudan-Delawanna, Inc.; "Research Trends in Perfumery Materials," by Paul Z. Bedoukian, consulting chemist; "Odor Preferences Among Consumers," by Amos Turk, consulting chemist; "Instrumental Analysis of the Perfume Industry," by Ernst T. Theimer, van Ameringen-Haebler, Inc.; and "Fragrance Types and Merchandising Methods," by Mr. Thomas.

★

New Neville Laboratory

Neville Chemical Co., Pittsburgh, recently announced that construction has begun on a new $750,000 research laboratory at a site near the company's main plant. According to Lee V. Dauler, president, the new two-story, brick building will contain 31,000 square feet of floor space. Two thirds of the structure will be devoted to laboratory facilities and the remainder to administrative offices.

★

Magnus Named Lt. Colonel

Joseph Baird Magnus, executive vice-president of Magnus, Mabee & Reynard, Inc., New York, recently was appointed vice-commandant-vice-president of the Veteran Corps of Artillery of the State of New York, with the rank of lieutenant colonel. Mr. Magnus has been active in the corps since 1946.

Joseph Baird Magnus

Felton Shifts Eskenazy

Felton Chemical Co., Brooklyn, N. Y., recently announced the transfer of E. Eskenazy, flavor chem-

E. Eskenazy

ist, from its Brooklyn plant to its west coast branch in Los Angeles. Mr. Eskenazy joined Felton in 1952. He previously had been associated with essential oil and aromatic firms in Europe and South America.

★

New "Dial" Display Unit

A new "Dial" soap display unit, designed to fit into any size shopping cart, was introduced recently by Armour and Co., Chicago. Called "Dispens-mor," the new merchandiser is coral and brown in color, stands six feet tall, and can hold up to six cases of "Dial" when filled. Because it can fit into a shopping cart, the unit can be easily moved from one part of the store to another.

★

Oldbury Div. Name Dropped

The Oldbury Division name has been discontinued by Hooker Electrochemical Co., Niagara Falls, N. Y., it was announced recently by Bjarne Klaussen, president. Oldbury Division was the designation given to the Oldbury-Electro Chemical Co. after its merger into Hooker last November. However, the name and trademark of Oldbury will be retained in active use by Hooker as "Oldbury Products." The new name will be utilized to identify all chemicals produced by Hooker in the former Oldbury plants located in Niagara Falls and Columbus, Miss.

Quality Tested

For no-rub waxes with greater shelf-stability

plus gloss scuff resistance durability leveling anti-slip

#65 *Refined white* ***shellac***

Leading manufacturers of water emulsion waxes and polishes have adopted Mantrose shellac because of its high quality, uniformity and stability.

The Mantrose Corporation

Importers • Bleachers • Manufacturers

1 HANSON PLACE • BROOKLYN 17, N. Y.

Agents and warehouse stocks in principal cities:

Allied Basic Chemical Co. Montreal 24, Canada
Allied Basic Chemical Co. Toronto 12, Canada
J. A. Castro Havana, Cuba
C. M. Durbin Company Cincinnati, Ohio
O. L. West Wynnewood, Pa.
Cuyahoga Chemical Co. Cleveland 13, Ohio
Harry Holland & Son, Inc. Chicago 6, Ill.
R. L. Kelley Danbury, Conn.
J. M. Washburn Co. Arlington 74, Mass.
H. C. Ross Burbank, Cal.
E. M. Walls Company San Francisco, Cal.
Harry Holland & Son, Inc. Detroit 38, Michigan

Pizzolato in New Post

Victor A. Pizzolato has been appointed manager of toiletries of Lehn & Fink Products Corp., it was

Victor A. Pizzolato

announced recently by O. G. Kennedy, general manager. In his new post, Mr. Pizzolato will supervise all marketing of "Etiquet" deodorants and "Hinds Honey & Almond" fragrance cream. For the past seven months, Mr. Pizzolato has been assistant manager of these two products. He previously had been associated with Rockwood & Co., New York, and Abraham & Straus department store in Brooklyn, N. Y.

★

Givaudan Names Cottle

Ben S. Cottle, Jr., has been appointed to the sales staff of Givaudan-Delawanna, Inc., New York and its affiliated companies, Givaudan Flavors, Inc., and Sindar Corp., both of New York, it was announced recently by R. E. Horsey, vice president in charge of sales. In his new post, Mr. Cottle will represent the firms in northern New Jersey. He is the son of Ben S. Cottle, Sr., a Givaudan employee for 25 years and manager of its Los Angeles branch.

Ben S. Cottle, Jr.

★

P&G Six-Months Profit Up

Consolidated net profit of Procter & Gamble Co., Cincinnati, reached a record $33,546,073 in the six months ended Dec. 31, according to the semi-annual financial report issued recently. In the corresponding half of the previous fiscal year, the net was $30,771,379. The profit after $32,652,000 for taxes, is equal to $1.72 per common share. It compares with $1.59 per common share for the 1955 period, after adjusting for the two-for-one stock split effected last June 1. The tax bill for that half year was $30,459,000.

★

Solvay Names Two

Robert B. Lautner has been named manager of the Moundsville, W. Va., chlorine-caustic soda plant of Solvay Process Division of Allied Chemical & Dye Corp., New York, it was announced recently. Mr. Lautner succeeds W. E. Dugan, Jr., who died in December. Mr. Lautner formerly was assistant plant manager. He will be replaced in that position by John L. Rourke, former superintendent of electrolytic operations at Solvay's Syracuse plant.

★

American Dispenser Moves

American Dispenser Co., New York, has moved its plant and general offices to new and larger quarters at 860 Broadway in downtown New York, it was announced recently by Burton L. Feinson, general manager of the soap dispenser manufacturer.

Formerly located at 115 East 23rd St., American Dispenser relocated primarily to provide added production capacity and facilities. The new headquarters provides an assembly line that is designed along modern work-flow principles to effect greater savings in manufacturing operations.

Becco Names Nelson

Dewey H. Nelson has been named sales manager of Becco Chemical Division of Food Machin-

Dewey H. Nelson

ery and Chemical Corp., New York, it was announced recently by Frederick A. Gilbert, president of Becco. Mr. Nelson fills a vacancy caused by the death of John F. Shea last November. Mr. Nelson was formerly assistant sales manager. He joined Becco in 1947, working first in the special products department and then in the research department. He transferred to sales in 1951 and was named midwest district manager in 1953. He was appointed assistant sales manager last August.

★

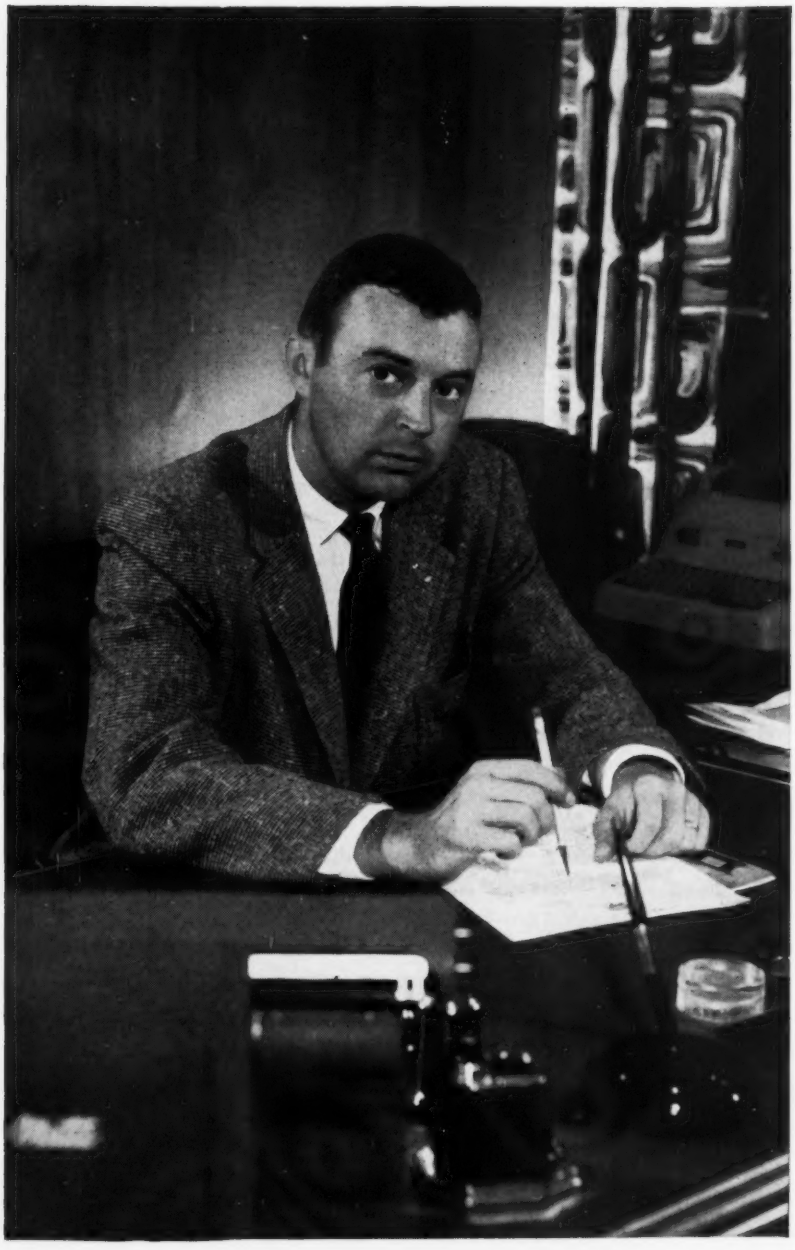
CSC Names Bauer

Appointment of Walter A. Bauer as manager of the St. Louis industrial chemicals sales district of Commercial Solvents Corp., New York, was announced recently by

Walter A. Bauer

"Free-flowing, non-caking TSP eliminates production and packaging problems in our production of water conditioners and detergents. Monsanto TSP adheres to our rigid specifications."

Mr. Walter C. Deuble, Vice-President, Climalene Company



Climalene Company and hundreds of other businesses buy millions of pounds of phosphates every year from Monsanto. Only Monsanto, the largest producer of elemental phosphorus, offers . . . the world's broadest phosphate line; an unfailing source of supply; twelve widely spread supply points for fast shipments; and superior technical and practical experience. Find out what these unique advantages hold for you. Send for "Sodium Phosphates for Industry." MONSANTO CHEMICAL COMPANY, Inorganic Chemicals Division, Dept. S.C.S., 710 North Twelfth Boulevard, St. Louis 1, Missouri.

MONSANTO

Where Creative Chemistry Works Wonders For You

Frank E. Maple, general manager of the industrial chemicals department. In his new post, Mr. Bauer will direct sales operations in southern Illinois, Missouri, Arkansas, Oklahoma, Kansas, Nebraska and Colorado. Mr. Bauer was formerly a company representative in Kansas City, Mo., Los Angeles and Chicago.

Other sales appointments announced by Mr. Maple include the assignment of Anthony J. DiNardo to the Cleveland office; Lee C. Holscher to the Cincinnati branch; and William C. Danielson to the Chicago district.

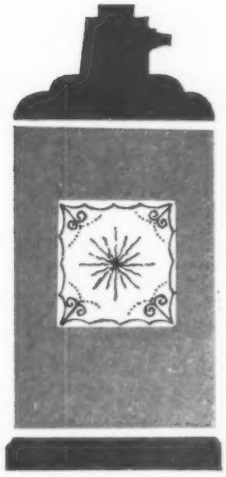
★

New Borax Dispenser

A new powdered soap dispenser, designed for complete recession in a wall, was introduced recently by 20 Mule Team Products Division of U. S. Borax & Chemical Co., New York, as part of its washroom improvement program. The 21-ounce, open-top dispenser is mounted on back of a locking door which swings out for rapid refilling. The only moving part of the product is the plunger which releases a measured amount of soap on the up-stroke. Both dispenser and nondrip tray, which can be removed only when door is unlocked, are of stainless steel.

New recessed dispenser for powdered hand soap introduced recently by the 20 Mule Team Products Division of U. S. Borax and Chemical Corp., Los Angeles. Dispenser is equipped with an open top that is mounted on back of locking door which swings out for fast filling.

MAJOR SOLVENT
FOR
NONFLAMMABLE PAINT REMOVERS



SOLVENT-PROPELLENT
FOR
AEROSOL FORMULATIONS

Versatile METHYLENE CHLORIDE does these jobs...and more

PROPERTIES

Formula	CH_2Cl_2
Molecular Weight	84.94
Boiling Point	39.8°C. 103.6°F.)
Freezing Point	−95.7°C.(−142.1°F.)
Specific Heat	
cal. g. °C. or B.T.U. lb. °F.	
Liquid (20°C.)	0.276
Vapor (cp) (B.P., 1 atm.)	0.152
Specific Gravity 20/4°C.	1.326
Weight per Gallon (20°C.)	11.07 lbs.

The major constituent of nonflammable paint removers is methylene chloride. Used in combination with additives, activators, wetting or coupling agents, it is highly effective on a wide variety of finishes, including those containing many of the newer resins.

Nonflammable and of low toxicity, methylene chloride is also used in low-pressure aerosols as a diluent and pressure depressant for the more expensive higher-pressure propellents . . . and as a solvent for the active ingredients. This solvent action helps minimize plugging of the dispensing nozzle and keeps the active ingredients completely in solution in storage.

In addition to these two popular uses, methylene chloride is also used in resin castings, cold-cleaning compositions, low-temperature brine coolants, extraction operations and adhesive preparations.

Du Pont has available literature on this versatile solvent covering handling and storage, chemical and physical properties, and other useful information. Why not send for it today? The coupon below will bring a prompt response.

DU PONT
METHYLENE CHLORIDE

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

E. I. du Pont de Nemours & Co. (Inc.)
Electrochemicals Department • Wilmington 98, Delaware

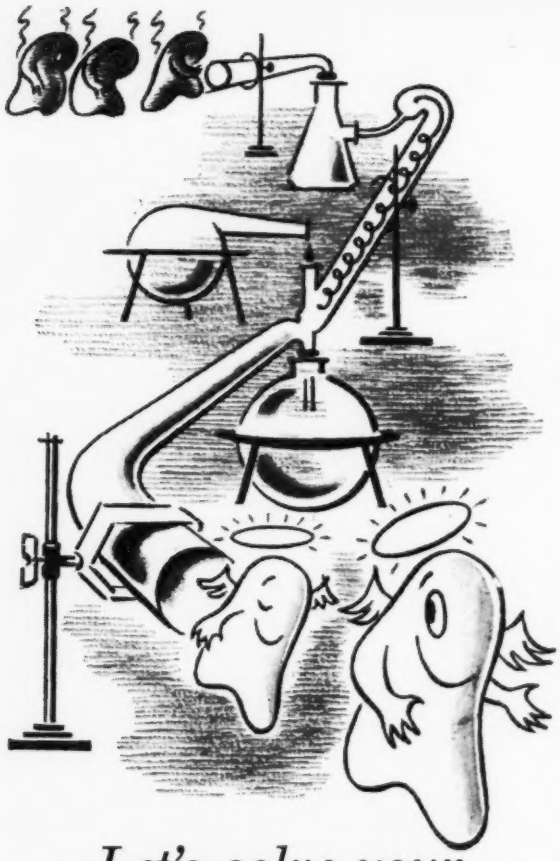
Please send me full specifications, handling and storage data on Methylene Chloride.

*Name*_____ *Title*_____

*Firm*_____

*Address*_____

*City*_____ *Zone*____ *State*_____



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SCIENTIFICALLY!

Whether your product odor problem is difficult, unusual or simply routine, Sindar can provide you the correct scientific solution.

We are pioneers in this field, with specialized knowledge and experience. We have developed specific deodorants and reodorants for practically every purpose...waxes, polishes, disinfectants, bleaches, industrial cleansers, auto specialties, adhesives, starches, solvents, and many other products.

We are ready to work closely with you in ridding your product of an objectionable odor ...or giving it a competitive edge with an appealing odor *profitably and economically*. Write us describing your specific problem.

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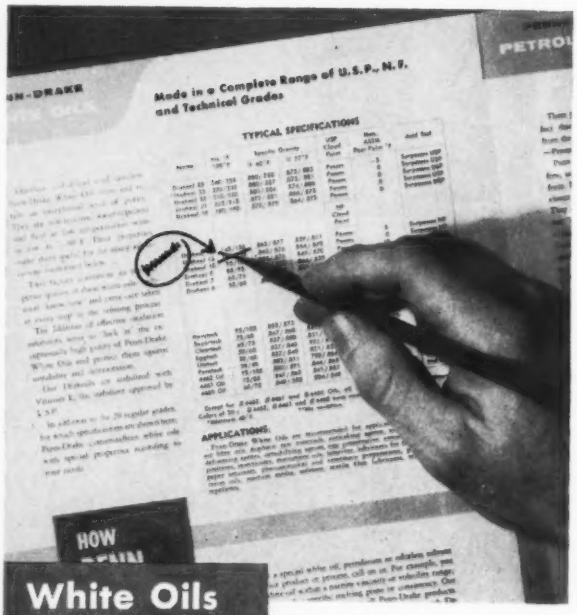
We alter our specifications

...TO IMPROVE YOUR PRODUCT



White Oils
Petrolatums
Solvents
Sulfonates

If a small change from the established specifications of any Penn-Drake product will help your processing procedure, or assure *you* of a better product, we will make the change for you. For example, we can furnish white oils with specific viscosities, pour points or other properties . . . petrolatums with unusual consistencies and specific melting points.

PENN-DRAKE®

Custom Refining Service

Write for detailed specifications or consult the Penn-Drake Technical Service.

penn drake products

PENNSYLVANIA REFINING COMPANY
BUTLER, PENNSYLVANIA
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Representatives in all Principal Cities

percent of the combination type products; and 0.6 percent synthetics. In 1956 the company made 27.7 percent fatty acid derived products; 43.2 percent combinations; and 29.1 percent synthetics.

Mr. Young mentioned the trend towards increasing use of tall oil, which offers in addition to favorable price levels the advantages of good hard water characteristics and temperature stability. But Mr. Young stressed the importance of keeping the ultimate products' end use in mind when deciding on the basic material. He expressed the belief that fatty acids and synthetics will find their balance in the overall picture based on end use considerations.

Concurrently with the Fatty Acid Division's session the Technical Advisory Committee held a business meeting and heard progress reports and recommendations.

Following these sessions a reception and cocktail party was held at which *Soap and Chemical Specialties* was host.

General Session

A GENERAL session, at which the meeting was formally opened was held the morning of Jan. 24 with F. B. Patton of Armour & Co., presiding. The Association's president, E. B. Osborn of Economics Laboratory, Inc., welcomed new members and reported on some of the highlights in the association's activities during 1956. These include the $129,000 joint project for the study of sewage contamination, cleanliness promotion, statistical activities, work on Federal Specifications, and the campaign against industrial dermatitis. Mr. Osborn paid tribute to Adrien F. Busick, retiring counsel, who has served the association in this capacity since its inception in 1926.

Mr. Osborn reported dismissal of the suit of the Department of Justice against the association and three member companies. The suit was dismissed on Sept. 13, 1956 by Judge Alfred E. Modarelli, U.S. District Judge for the District of New Jersey, at Newark. The Department of Justice has appealed this dismissal and the facts will be reviewed by the Supreme Court, with a decision expected during the current year. Basis for the dismissal of the suit was the refusal of the Justice Department to make available to the defendants evidence composed of material subpoenaed in 1951 by the Grand Jury in Newark from many companies inside and outside the association. The evidence is being withheld by the department in the face of an order by the Judge.

The presidential address and review of the year was followed by a talk on the "Business Outlook for 1957," given by Roy L. Reierson of Bankers Trust Co. A levelling off and perhaps even a sag in business activity is seen possible in 1957, provided the international situation does not deteriorate.

Last presentation in this general session was a "Report from a Scorekeeper" by Burton V. LeVee, A. C. Nielsen Co. Records show that sales of soap and synthetic detergents from 1950 to 1956 have closely parallelled sales of all commodities in grocery stores, which in turn have kept pace with disposable income.

Concurrently with the general session, the Glycerine Division held a business meeting presided over by W. W. Bray of Procter & Gamble Co. A report on glycerine promotion was presented by H. H. Besuden of P & G. This was followed by a report on "The Glycerine Situation Today" presented by E. Scott Pattison, manager of the association's Glycerine Division. Mr. Pattison's report will appear in full in a future issue of SOAP.

After Mr. Pattison's talk the division elected its officers for 1957. G. W. Huldrum, Jr. of Shell Chemical Corp. becomes chairman and G. A. Sloan of Colgate-Palmolive Co., vice-chairman. The following were elected to the committee: W. W. Bray, Procter & Gamble Co.; W. H. Cochrane, Lever Brothers Co.; F. E. Lacey, Swift & Co.; A. W. Schubert, Emery Industries, Inc.; W. G. Zaruba, Armour & Co.

William McChesney Martin, Jr., chairman, board of governors, Federal Reserve System, luncheon speaker on Jan. 24, outlined the legislative and other measures by which government is fighting inflationary trends and pointed at the delicate balance of our economic position. The session was presided over by W. H. Burkhart, president of Lever Brother Co.

The 1956 glycerine research awards were presented to the winners by A. K. Tosh of Colgate-Palmolive Co., chairman of the glycerine research committee. Herbert J. Dutton, United States Department of Agriculture research chemist won the first award of $1000 and an honor plaque. Dr. Dutton's award winning accomplishment was the application of a recently developed extraction technique to investigate complex natural glycerides. Fundamental data obtained by Dr. Dutton on the structure of natural glycerides sheds light on the mechanism by which these glycerine derivatives are synthesized in nature. His work may lead to commercially feasible separation of chemically pure triglycerides or "tailormade" fractions from fats and oils which would enhance the utility of fats and oils as industrial chemical raw materials.

Second award, $300 and an honor plaque, went to Donald B. Zilversmit, professor of physiology at the University of Tennessee Medical Units, Memphis, for his use of glycerine as a suspension medium in preparing high-caloric fat emulsions for intravenous injections.

Stanley G. Knight, professor of bacteriology at the University of Wisconsin, won the third award, $200 and a plaque, for research establishing a glycerine derivative, triacetin, as a new fungicide. Triacetin ointments and lotions were found to be effective fungistats in cases of superficial fungus and allied infections of skin, nails and scalp.

Glycerine Division

THE Glycerine Division met the afternoon of Jan. 24 to hear three papers. George R. Somerville of Shell Chemical Co. spoke on "Glycerine in Alkyd Resins." Frank J. Steele, chief pharmacist at Greenwich Hospital, presented a paper entitled "Glycerine in Pharmaceuticals and Cosmetics." In pharmacy, glycerine is used as a solvent, sweetening agent, thickener, moistener, and in some instances as a plasticizer. In cosmetics it acts as humectant and plasticizer. Glycerine is one of the most widely used vehicles for medicinal substances. The speaker gave a number of representative formulations showing the wide range of glycerine's utility.

The third paper in this session was a report on the "Cellophane Outlook," by Thomas H. Derby of American Viscose Corp. Cellophane today is a 400 million pound market, Mr. Derby said. Its future is bright. Optimism is backed by producers' decision to increase productive capacity. American Viscose is stepping up production capacity by 50,000,000 pounds; Olin has embarked on a 40,000,000 pound expansion program; and du Pont has announced plans to increase annual capacity by 30,000,000 pounds. Cellophane's versatility gives it an advantage over other films, which are usually more specialized in their applications. Mr. Derby paid tribute to the new and improved plasticizers and acknowledged the contributions made by the converter.

The events of Jan. 24 were concluded by the annual washable cotton fashion shows introducing the "Maid of Cotton for 1957."

A breakfast, sponsored by *True Story Magazine*, started the program of Friday morning, Jan. 25. This was followed by a general session, presided over by T. G. Hughes of Oronite Chemical Co. In a paper, "Continuing Research Related to Detergents in Water and Sewage Treatment," by Henry V. Moss, Monsanto Chemical Co., it was indicated that alkylbenzene sulfonate in concentrations now present in sewage does not affect bacterial life nor otherwise significantly affect the efficiency of sewage plant operation. The main problem consists of frothing and methods are being developed to cope with it. However, alkylbenzene sulfonate in raw sewage is not completely eliminated by existing conventional sewage treatment methods and some proportion goes off in its original or partially degraded form through the effluent. Attempts are in progress to isolate specialized strains of bacteria capable of completely degrading alkylbenzene sulfonate. But at this stage there is little promise that such strains can be made to subsist in sufficient concentrations in a sewage plant to be effective. Polyphosphates, which have been suspected of interference in water treatment, do not find their way into raw water in concentrations high enough to pose a real problem. A further appropriation of funds is sought to support more

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research into the complex problem of alkylbenzene sulfonate disposal.

"How the Association Promotes Cleanliness" was described in a presentation by W. G. Werner, Procter & Gamble Co. Mr. Werner called on Roy Peet to supply some of the history and background of the association's cleanliness promotion campaigns. Mr. Peet said that the objectives of the program were set up by the association's founders in 1926: namely, the active promotion of cleanliness as an aid in the prevention of disease, in building morale, and in imparting a general feeling of well-being. Fundamentally these key notes have remained unaltered. Until last year this program was directed exclusively to individuals through consumer publicity campaigns. In 1956 the program was broadened to cover skin cleanliness in industry. This year the educational program is being expanded to take in sanitation nad sanitary maintenance of buildings and equipment.

The association's cleanliness bureau supplements the paid space and time used by members for brand advertising. Stories and pictures are prepared for use by editors and broadcasters in newspapers, magazines, on radio and television. How the bureau fulfills its function was demonstrated by Mr. Werner with the help of slides and tape recordings. The bureau's messages are estimated to reach 1.6 billion circulation through daily newspapers and about 282 million circulation through magazines. In addition they reach a vast radio and television audience.

Technical men in management and management's voice in research, in other words mutual respect, understanding, and harmonious cooperation are the key to "Making Product Research Pay," the subject of a talk by Milton Harris, Gillette Safety Razor Co. While it is hard to assess the cash returns of an idea or invention, returns of research venture capital can be ensured up to a point by making management, research personnel, production men, market development, sales and other parts of a commercial enterprise equal partners in the choice of research areas. According to Mr. Harris the "Ivory Tower" type of research still has its rightful place but this place is not often located in industry. Mr. Harris' theme of applied research as a cooperative and pin pointed effort was illustrated by two case histories. J. J. Clarey of Bristol-Myers Co. presented "The 'Ban' Story." He outlined the vicissitudes, trials, modifications, and eventual success of his firm's personal deodorant in a novel form of packaging. "The 'Jet-Bon Ami' Story" was told by Daniel H. Terry, Bon Ami Co. This will appear in full in a future issue of SOAP.

The luncheon on Jan. 25 was presided over by Neil H. McElroy, president of Procter & Gamble Co., who introduced Dr. L. E. Burney, surgeon general, U.S. Department of Health, Education and Welfare. Dr. Burney spoke on "Cleanliness and Health." In addition to soap and water cleanliness, Dr. Burney stressed the importance of such issues as stream pollution and pollution of the atmosphere. He expressed the belief that the solution of these major problems of modern society is to be sought in methods of persuasion rather than enforcement. Cooperative efforts on the part of local government and industry are the key to cleaner communities.

Luncheon was followed by the association's annual business meeting which heard reports by Roy W. Peet, association manager; Nils S. Dahl, treasurer; and A. W. Schubert, chairman of the nominating committee. The 1957 board of directors was elected. New members are E. H. Bluman, Wallace & Tiernan, Inc., and Earl Brenn, Huntington Laboratories, Inc. Re-elected to the board were: F. B. Patton, Armour & Co.; W. L. Sims II, Colgate-Palmolive Co.; E. B. Osborn, Economics Laboratory, Inc.; A. W. Schubert, Emery Industries, Inc.; W. H. Burkhart, Lever Brothers Co.; A. W. Forthmann, Los Angeles Soap Co.; J. L. Christian, Monsanto Chemical Co.; N. H. McElroy, Procter & Gamble Co.; G. W. Huldrum, Jr., Shell Chemical Co.; Nils S. Dahl, John T. Stanley Co.; J. Mayberry, R. R. Street & Co.; E. A. Moss, Swift & Co.; and F. J. Pollnow, Jr., Vestal Laboratories, Inc.

The convention was concluded by a reception and the annual banquet held on Friday evening, Jan. 25.

Throughout the three days of the convention the association showed an industry-wide exhibit entitled "Pioneering Pays – Yesterday and Today."

—★—

New Houchin Crutcher

A new crutcher, designed for mixing high viscosity chemicals and soap stocks, was introduced recently by Houchin Machinery, Inc., Hawthorne, N. J. The new machine operates at a speed of 23.3 to 93 RPM, and is instantly adjustable to any intermediate speed without stopping the motor. It is equipped with an adjustable draft-tube and a sweep paddle, which ejects the complete charge after mixing and cleans the bottom. Capacity of the tank is 1,400 gallons. Further information may be obtained from the company, 6th & Van Winkle Avenues, Hawthorne, N. J.

—★—

Pennsalt Appoints Land

Appointment of Hugh C. Land as general manager of the industrial division of Pennsylvania Salt Manufacturing Co., Philadelphia, was announced recently by William P. Drake, president. The industrial division recently was formed through consolidation of Pennsalt's Sharples and industrial chemicals division.

Mr. Land was formerly general manager of the industrial chemicals division. He joined Pennsalt in 1946 as a field engineer and subsequently served as assistant superintendent of the firm's Wyandotte, Mich., plant, and as production manager of the industrial chemicals division.

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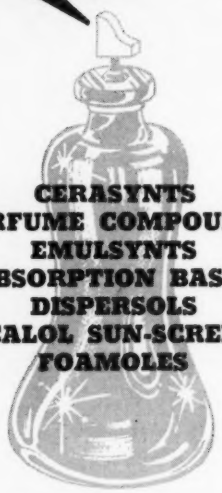

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Amoco Appoints Two

Two managerial appointments in the newly-formed Amoco Chemicals Corp., Chicago, were announced recently by Jay H. Forrester, president. Howard R. Peterson has been named manager of special products in the marketing department while George A. Harrington has been appointed general manager of development.

Mr. Peterson was formerly manager and vice-president of the sales department of Indoil Chemical Co., Chicago. Indoil was one of three Standard Oil Co. (Indiana), Chicago, affiliates that was consolidated to form Amoco. He joined Standard Oil in 1923 as a salesman in Iowa. In 1935 he was transferred to the firm's technical sales office in Chicago and in 1945 he organized Standard Oil's chemical products department, of which he was sales manager until his transfer to Indoil four years later.

Dr. Harrington had been market research director of Indoil since 1953. Prior to that, he had been associated with Solvay Process Division of Allied Chemical & Dye Corp., New York, and Mallinckrodt Chemical Works, St. Louis.

New du Pont Process

(*From Page* 161)

which are capable of depositing active ingredient coatings not readily removed by washing.

Usual aerosol emulsion products up to this time, du Pont chemists explained, have been oil-in-water systems where the propellant is dispersed in the aqueous phase. However, attempts to obtain sprays from systems of this type by increasing the proportion of the propellant usually result in extensive foaming problems, either at the orifice of the valve or on the sprayed surface.

The new du Pont process utilizes oil-soluble, surface-active agents which tend to produce less foam upon spraying than do water-soluble agents. The oil phase may consist of propellant alone or a mixture of propellant and hydrocarbon oil, such as odorless mineral spirits or deodorized kerosene. Complete details of du Pont's emulsion systems may be obtained on request to the company, 7502 Nemours Building, Wilmington, Del.

Metal Containers

(*From Page* 135)

sions from the atypical results sometimes found in a single container. The variables include not only the containers prepared with different combinations of component materials, but also the storage temperatures. For example, if an automobile polish is being tested and it has been decided that four container variables and two storage temperatures will be used for the tests twelve cans each of the four variables would be stored at each storage temperature. Thus, this test program requires handling a total of 96 cans.

It has been established that for the type of tests described, examination after one month, three months, six months, and one year's storage is the optimum schedule for deriving suitable container specifications for a given product. However, this schedule is often tempered by the date on which it is necessary to have information. While six months storage data has been found to be the minimum for safely predicting commercial behavior of the container variables, it may be that the product manufacturer wishes to market his product within less than six months after container tests are initiated. In this case, the best container in test at the time the product is to be marketed is generally chosen, although it may be that this container will not prove to be satisfactory for more than a few months after packing. This emphasizes the need for extensive testing of new products before marketing – the shorter the test period, the greater the risk of inadequate commercial container performance.

(*To be continued*)

Dine to South America

Daniel Dine, assistant export manager of Marchon Products, Ltd., London, arrived in Kingston, Jamaica early this month on the first lap of a three-month South American good will tour. During his visit, Dr. Dine will confer with Marchon customers and representatives in that country. Dr. Dine is the second Marchon representative to visit South America. In 1951, Michael Dufaye, export manager, toured the continent in an effort to develop the firm's export trade there.

Daniel Dine

—★—

FMC Names Seglin

Leonard Seglin has been named manager of engineering development of the organic chemicals division of Food Machinery and Chemical Corp., New York, it was announced recently by Henry S. Winnicki, division president. Mr. Seglin was formerly supervisor of process engineering for FMC's chemical divisions group. Mr. Seglin joined FMC when the company acquired Westvaco Mineral Products Co. and later served as supervisor of economic evaluations of that division. He previously had been associated with Ethyl Corp., New York.

Leonard Seglin

—★—

Jefferson Names Three

Appointment of three district sales managers of the Jefferson Chemical Co., Houston, Tex., was announced recently by Donald L. Griswold, general manager of marketing. George H. Kahl has been named New York sales manager, while Kenneth L. Vander Voort and John G. Sibley have become sales managers in Chicago and Charlotte, N. C., respectively. Mr. Kahl joined Jefferson in 1954. Mr. Vander Voort has been with the company since 1952, while Mr. Sibley came to Jefferson in 1953. All three men formerly were sales representatives.

—★—

New P&G Plant in Belgium

A new plant for the manufacturer of detergents was opened on Jan. 30 by Procter & Gamble Co., Cincinnati, at Malines, Belgium. The new unit is expected to supply three countries, Belgium, Luxembourg and the Netherlands, with its products.

The plant was built by Procter & Gamble S.A. with a $2,000,000 loan from the Belgium Credit to Industry Co. (a state financing organization to promote investments) and the same amount from the United States parent company.

The factory occupies about 24.7 acres in the Malines industrial suburb, midway between Antwerp and Brussels. It will employ about 225 persons. Walter Lingle, vice-president of the American parent company, and Frederick Alger, Jr., United States Ambassador to Belgium, attended the ceremony. Previously the company's products were imported into Belgium from a British subsidiary at Newcastle-on-Tyne.

Hollingshead Names Baen

R. M. Hollingshead Corp., Camden, N. J., recently announced the appointment of Jack N. Baen as research supervisor of its market development department. Mr. Baen formerly was market research manager of Penn Fruit Co., Philadelphia. He previously had been associated with Atlantic Refining Co., Philadelphia. Mr. Baen is also an instructor of marketing at the evening sessions of Temple University.

Jack N. Baen

—★—

D&O Appoints Rogers

Appointment of Hatton B. Rogers as vice-president of Dodge & Olcott, Inc., New York, was announced recently by Frederick H. Leonhardt, Jr., president. Mr. Rogers joined the essential oil firm in 1954 as director of the dry solubles division. Previously he had served as director of technical service for Huron Milling Co.

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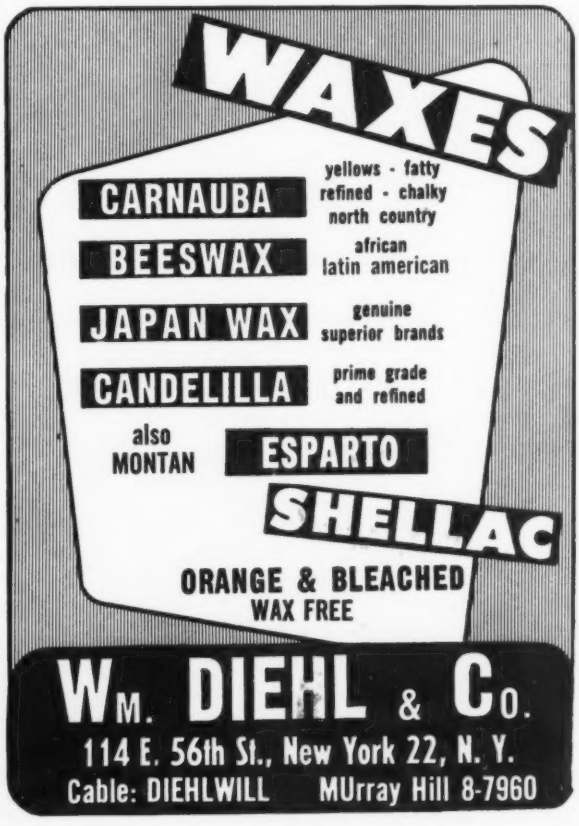

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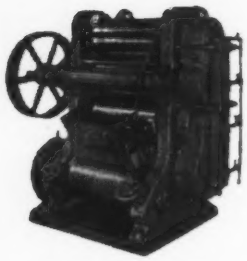

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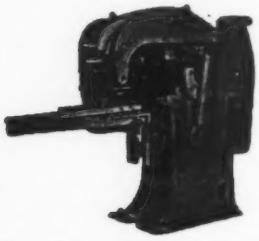

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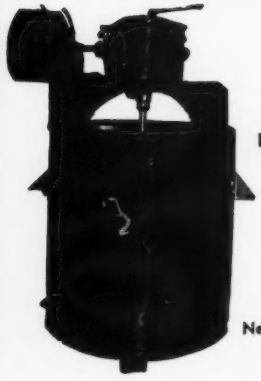

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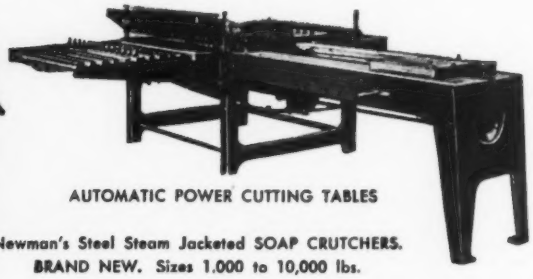

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Master Mechanic: For Connecticut aerosol filling plant. Excellent opportunity for Master Mechanic with broad experience in equipment design, plant layout and plant maintenance, with background in equipment and processing, filling and packaging of cosmetics, drugs, etc. Aerosol knowledge desirable but not essential. Top salary with great future. Our organization knows of this ad. Resumes kept confidential. Address Box 781, c/o *Soap*.

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Chemist, Ph.D.: 9 years experience. Development, research and production. Specialized in soaps, glycerine, fatty acids and oils. Formulation and publications. Desires responsible position. Address Box 797, c/o *Soap*.

Expert Soap Man: Having long experience in the manufacture of all kinds of laundry and toilet soaps, and cleaning compounds. Glycerine recovery, and soap chemist. Address Box 795, c/o *Soap*.

(*Continued on Page* 207)

SALESMAN
Basic manufacturer of insecticide concentrates has opening for salesman to cover Iowa, Wisconsin, Minnesota, and eastern Dakotas selling to manufacturers and wholesalers. Headquarters Minneapolis. Salary, expenses and incentive plan. Prefer man with some sales experience and training in entomology or chemistry. Our personnel aware of this ad. Your reply confidential.
Address Box 800
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254 W. 31st St., New York 1, N. Y.

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Manufacturers

Miscellaneous

Wanted: Chemical company equipped to manufacture and package waxes, polishes, and cleaners. Additional facilities for contract packaging would be desirable too. N. Y. metropolitan area. Address Box 798, c/o *Soap*.

Distributors Wanted: Some territories still open for distributors to sell Speedy White liquid white wall tire cleaner and other quality automotive chemical products. Exclusive territory for producers. Busy season just approaching. Modern Chemical Specialties Corp., 86 Industrial St., Rochester 6, N. Y.

Equipment Wanted: Automatic filler for foam type products; also screw capper and laveller, 8 oz. to quarts, 60—120 per minute. State age, make, model and other details. Address Box 799, c/o Soap.

Equipment Wanted: Powder Filler for 5 lb. cartons.—Carton Sealer for item 1.—Powder Mixer, ribbon or similar action type of capacity from 1,000 to 2,000 lbs. Address reply to State Chemical Mfg. Co., Cleveland 14, Ohio.

Chicago Area: Manufacturer's Representatives. Expanding organization with warehouse facilities will consider exclusive representation for merchandise sold to hotel, hospital, institutional and industrial trade. Address Box 801 c/o *Soap*.

Available: 64 page listing of "Synthetic Detergents Up-to-Date", (1955). Write John W. McCutcheon, 475 Fifth Ave., New York 17.

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For Sale: One (1) World semi-automatic labeler model S $325. Good running condition. Gilbreth Co., 1211 Chestnut St., Phila., 7, Pa.

For Sale: (3) Sprout-Waldron 12,000 lb. (336 cu ft.) Ribbon Mixers; (6) Day and W & P double arm sigma blade mixers 50, 75 and 100 gal. working cap.; also large stock stainless steel and aluminum tanks and kettles; pulverizers, Hammer mills, etc. Perry Equipment Corp., 1410 N. 6th St., Phila., 22, Pa.

Dehydrated Plant has open time available on spray and tray drying equipment for contract, custom or experimental drying of soaps, detergents, chemicals, and drugs. H. Gartenberg & Co., Inc. 412 W. Pershing Rd., Chicago 9, Ill.

576 Pages of practical information, testing & uses of disinfectants, household & industrial insecticides, floor products, soap, specialties, etc. Covers also the subject of labeling and packaging of insecticides, etc. See page 190 for particulars.

For Sale

For Sale: Plodders. 4′ x 9′ chilling roll. 3 & 4 roll granite & steel roller mills. Grinders. Chippers. Crutchers. Slabbers. Cutting tables. Kettles. Filter presses. Mixers. Sifters. Foot and power soap presses. Partial listing. We buy your surplus equipment. Stein Equipment Co., 107 - 8th St., Bklyn. 15, New York.

For Sale: By I. E. Newman, 818 W. Superior St., Chicago, Ill., Crutchers 1000-8000#; Wrapper type S; Plodder 10"; Auto. table 2 way; Jones auto. presses; 100-8000# powder mixers; 2-6000 gals. SS tanks, 10′ dia. x 10′ high, with 5 HP portable mixer; P&S rolls, 48"x68" long & 14"x68"; 3 roll mill 16"x40" with 40 HP motor; 1500 gal. steel tank, with coils; Boilers; All kinds soap and chemical equipment.

Standard Reference Books:

See Page 212

USI Names Johnson

Appointment of Warren E. Johnson as manager of alcohol and chemical sales for U. S. Industrial Chemicals Co., New York, was announced recently by R. E. Hulse, division general manager. In his new post, Mr. Johnson will supervise sales of USI industrial alcohols, solvents and related chemicals. Mr. Johnson joined USI in 1940 and, for the past six years, was manager of chemical sales. Prior to that he served as manager of the firm's Boston sales division.

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National Soap Dispenser Co.
230 W. 116th St. Los Angeles 61, Calif.

FMC Organizational Change

Food Machinery and Chemical Corp., New York, last month announced that its Ohio-Apex Division has become part of its newly-formed organic chemicals division. Ohio-Apex manufactures a complete line of plasticizers and resins.

—★—

More Monsanto Phenol

Monsanto Chemical Co., St. Louis, recently announced plans for the expansion of phenol production facilities at its Monsanto, Ill., plant. According to Charles H. Sommer, vice-president and general manager of the firm's organic chemicals division, Monsanto will invest several million dollars in the operation. The expansion, scheduled for completion in the second half of 1958, will increase Monsanto's phenol capacity by 25 percent.

Chlorothene in Aerosols

(*From Page* 105)

rothene. All formulations also contained approximately 20% ethanol and were based on polyvinyl pyrrolidone. The toxicological data obtained in this study indicated that there was no appreciable difference between hair lacquer samples containing 26% Chlorothene and those hair lacquer samples containing no Chlorothene insofar as effects resulting from contact with the skin, the eye or from inhalation are concerned. It is our intention to discuss the use of Chlorothene in applications of this type with the appropriate regulatory agencies.

In this discussion we have pointed out some of the aspects of Chlorothene which should be considered in its application to aerosol formulations. Chlorothene has good solvent activity and yet gives few valving problems and may be considered for cleaning and treating applications involving all fabrics and many of the common surfaces found in the home and industry. As a pressure depressant Chlorothene will conserve propellent 12 and give lower pressures at high temperatures increasing the safety factor of the formulation. In formulations containing a separate water phase Chlorothene is not indicated. However, Chlorothene will tolerate considerable dissolved water without can corrosion. Finally, Chlorothene may be considered promising for hair lacquer formulations in which its low toxic hazard and solvent properties are featured.

As the Reader Sees It

(*From Page* 39)

whole of Australia and have experience in importation and also manufacturing under licence from overseas companies in other branches of our business. At the present moment we are manufacturing under licence from principals in Europe and England.

Having set out our ideas in this matter we were wondering if you could advise us from your experience which would be the best method of going about this or perhaps better, you could put us in touch with an American company which would be interested in discussing this matter with us and in trade to Australia.

We consider that we should emphasize that owing to the competition in this country from the largest chemical manufacturers of the world, the company with whom we should be able to do business would need to be large and with a large research staff and that the products would bear competition of the companies at present operating from overseas in Australia.

From our limited knowledge of your country and your companies, we consider that such companies as Fuld Brothers, J. I. Holcombe or Hysan Products Co. would be the type we are interested in contacting, but of course we would leave this decision to you.

In this regard we advise you that the writer will be in the United States of America in September of this year and should any companies be interested he will be happy to discuss the matter further with them.

We offer you as a reference for our company, the English, Scottish & Australian Bank Ltd., King & George Sts., Sydney.

We would advise you that we are making the same request to the Chemical Specialties Manufacturers Association of New York.

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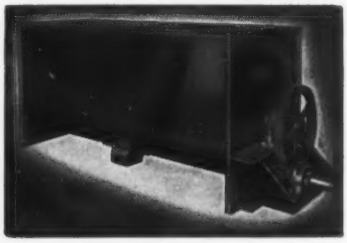

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New Trade Marks

(*From Page* 143)

Claims use since June 2, 1956.

Eveready and Prestone—Each for windshield cleaning chemical composition. Filed June 22, 1956 by Union Carbide and Carbon Corp., New York. Claims use since on or about March 8, 1956.

Rhythm—This for shampoo, Filed June 25, 1956 by Colgate-Palmolive Co., New York. Claims use since Sept. 16, 1955.

Long Life—This for combination cleaning fluid and non-oil lubricant for tape and tape machine parts. Filed June 25, 1956 by EMC Recordings Corp., St. Paul, Minn. Claims use since June 24, 1955.

Jeanne Nadal—This for hair shampoos, toilet soaps, and soapless cleaner for household use. Filed June 25, 1956 by Jeanne Nadal, Inc., Chicago. Claims use since July 1947.

Ex-It—This for air sanitizer. Filed Jan. 5, 1956 by H. W. Le Fevre, doing business as Le Fevre and Son, Oklahoma City. Claims use since June 1, 1955.

Psycon—This for chemical preparation for destroying larvae and pupae of filter flies. Filed April 12, 1956 by National Disinfectant Co., Dallas, Tex. Claims use since March 6, 1956.

Fatal-Fly—This for dry bait fly killer. Filed May 1, 1956 by Hess & Clark Inc., Ashland, O. Claims use since April 18, 1956.

Pellin—This for insecticide. Filed May 9, 1956 by Walter Ratner, Chicago. Claims use since June 3, 1955.

Diapertone—This for baby diaper rinse. Filed April 23, 1956 by Leo L. Goldfarb, doing business as Marple Drug Co., Broomall, Pa. Claims use since Feb. 2, 1956.

"Fia-Pil"—This for chemical fire kindler. Filed June 7, 1956 by Stan Stanton, doing business as Fia-Pil Enterprises, Arlington, Va. Claims use since June 6, 1956.

Sarine—This for corrosion and scale inhibitors. Filed June 15, 1956 by Herman Meyer Drug Co., Garwood, N. J. Claims use since April 4, 1951.

Snow Clean—This for bleach. Filed July 11, 1956 by Fred Herman & Sons, Inc., Houston, Tex. Claims use since Jan. 1, 1956.

Sup-R Zip—This for cleaner for upholstery, rugs, and other surfaces. Filed Oct. 31, 1955 by Florin Chemical Corp., Philadelphia. Claims use since on or about Sept. 26, 1955.

Krwosh—This for liquid detergent for washing motor vehicles and having incidental polishing properties. Filed Nov. 17, 1955 by K4 Products Co., Olean, N. Y. Claims use since June 21, 1955.

Whiz—This for cleaning and polishing materials in paste, liquid, powder, and solid form, for leather and imitation leather, windshields, lenses for automobile lamps, other glass and metal surfaces; dry cleaners; cleaning fluids for fabric, cloth, and leather surfaces; soaps in paste, liquid, powder and solid form but excluding paste grit soap; and other specialties. Filed March 13, 1956 by R. M. Hollingshead Corp., Camden, N. J. Claims use since Sept. 1905.

Kleen-o-Matic—This for transmission cleaner. Filed April 24, 1956 by Kleen-O-Products, Inc., Los Angeles. Claims use since March 12, 1956.

—★—

New Velsicol Bulletin

Velsicol Chemical Corp., Chicago, recently issued a new, 16-page technical bulletin describing its line of solvents for herbicides and insecticides. The booklet also lists physical properties, specifications and applications of the products. Copies of the bulletin, #214, can be obtained on request to the company, 330 East Grand Ave., Chicago 11.

Automation in Plant

(*From Page* 155)

the materials are automatically fed into a Sprout-Waldron "Pneu-Vac" system. They are conceyed through this system to a "Pneu-Vac" collector, and from there are discharged directly into the mixer. A time relay is then activated to attain a predetermined mixing time.

At the expiration of the mixing time, the discharge door of the mixer is automatically opened and the 4,000 pound batch conveyed directly to one of three drumming hoppers. The hopper to be used for drumming is selected by the operator at the control panel. In the case of some formulations, the material is conveyed from the mixer to an intermediate outlet hopper before being delivered to the drumming hopper.

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AFTER the material has been discharged into the drumming hopper, a sample of the compounded product is taken from the hopper and sent to the plant's control laboratory. Here it is completely analyzed to determine precise adherence to specifications and consistency in quality.

Packaging

AFTER the product sample has been taken, the product is discharged from the drumming hopper into kegs, drums, or bags, as required. When filled to the correct weight, these containers are then moved on roller conveyors directly to freight cars or trailers at the shipping dock on the north side of the building. The packaged product is then ready for shipment to the customer, or to finished stock inventory.

More Scent for Soap

(*From Page* 50)

have no ill effect on the soap during normal shelf life.

Depending on the end use of the product the concentration of perfume oil varies from as little as 0.25 percent to one percent. The lower concentrations are incorporated in liquid soaps for industrial applications such as textile processing. Liquid soaps intended for hand washing should contain 0.5 to one percent perfume concentration, which will retain the required fragrance when the soap is diluted in use.

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Coming Meetings

American Oil Chemists Society, fall meeting, Cincinnati, Sept. 30, Oct. 1 and 2. 48th annual meeting, Roosevelt Hotel, New Orleans, April 29-May 1.

American Society of Perfumers, third annual symposium on fragrance, Essex House, New York, March 20.

Chemical Market Research Association, Sheraton Hotel, Philadelphia, March 12-13.

Chemical Specialties Manufacturers Association, 43rd mid-year meeting, Drake Hotel, Chicago, May 20-22; 44th annual meeting, Hollywood Beach Hotel, Hollywood, Fla., Dec. 9-12.

Committee D-12 of the American Society for Testing Materials, Park Sheraton Hotel, New York, March 11 and 12.

Drug, Chemical and Allied Trades Section, New York Board of Trade, 67th annual meeting, Galen Hall, Wernersville, Pa., Sept. 19-21, 1957.

Entomological Society of America, southwestern branch, Gunter Hotel, San Antonio, Tex., March 11-12; north central branch, 12th annual meeting, Hotel Savery, Des Moines, Ia., March 27-29.

Folding Paper Box Association of America, annual meeting, Chicago, March 31 to April 4, 1957.

Grocery Manufacturers of America, 49th annual meeting, Waldorf Astoria Hotel, New York, Nov. 11-13, 1957.

International Sanitation Maintenance Show & Conference, 2nd annual exposition, Navy Pier, Chicago, Oct. 14-16.

National Association of Retail Grocers, Los Angeles, June 10-14, 1957.

National Packaging Exposition and Conference, International Amphitheatre, Chicago, April 8-11, 1957.

National Pest Control Association 24th annual convention, Louisville, Ky., Oct. 21-24.

National Sanitary Supply Association, national trade show and convention, Conrad Hilton Hotel, Chicago, March 31, Apr. 1-3 1957.

Packaging Machinery & Materials Exposition, Convention Hall, Atlantic City, N. J., March 25-28, 1958.

Synthetic Organic Chemical Manufacturers Association, monthly luncheon meetings, Roosevelt Hotel, New York, Feb. 14, March 12, April 10; annual outing, Skytop, Pa., May 26-28.

Toilet Goods Association, 22nd annual convention, Waldorf-Astoria Hotel, New York, May 7-8, 1957.

Western Plant Maintenance and Engineering Show and Conference, Civic Auditorium, San Francisco, June 11-13.

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Tale Ends

THEY tried to demote Frank J. Pollnow, Jr., president of Vestal Laboratories, Inc., St. Louis, at luncheon during the recent soap industry meeting in N. Y. Frank was introduced as "vice-president" of Vestal. A few raised eyebrows. Then he was re-elected a director of the Soap Association for 1957. This time they introduced him as president of Vestal. So, we assume, somebody who had done the demoting thought better of it and immediately arranged for his promotion back to president again. Last we heard, he was still president.

* * * * *

When Earl Brenn of Huntington Laboratories, Inc., won a clock-radio as a door prize during the recent Soap Assn. meeting in New York, it was the fourth consecutive year he won such a prize. The guy should be declared ineligible lest the Brenn residence in Fort Wayne, Ind., take on the appearance of an appliance shop. Maybe now that Earl has been elected a director of the Soap Association his luck will change. As a board member Earl is following in the footsteps of his dad, J. L. Brenn, who served on the board for several years.

* * * * *

Shades of yesteryear! Max Brown, sales veep of Fels & Co., Philadelphia, recently received a coupon from a 1907 magazine advertisement which offered a soap chipper. In case any of you younger blokes don't know what a soap chipper is, ask your grandmother. For those unfortunates who don't have grandmothers, a soap chipper was used to shave bar soaps in the days before all these new fangled soap flakes and soap and detergent powders and beads were available.

* * * * *

One vote for Joe Smith! Yup, the gentleman who created such a stir at the Republican National Convention last summer has popped up again. This time he gets one vote as president of SAACI (Salesmen's Association of the American Chemical Industry.) Actually, Vincent Rebak, Grace Chemical, was the regular unopposed candidate for the office and was duly elected. Who cast the one opposing vote? None other than Senor Rebak, who felt he could hardly vote for himself. Such modesty in politics is refreshing. Anyway, here's luck to the new SAACI president.

* * * * *

Green soap used for years by the inmates of the Butler County Jail at Hamilton, Ohio, is henceforth taboo. It seems too many iron window bars were being sawed through and the saw marks camouflaged with the green soap. So from now on it's nice white soap for all prisoners. The first real excuse for white soap we've run across in years!

* * * * *

Now we know how to pronounce "Bon Ami." Not like a Frenchman would say it, but strictly in Americanese. Ruthrauff & Ryan, advertising agency for the product, tested 332 girls and found out that 17 different pronunciations were in use. But all is well because most of those tested pronounced it the way the company wants it with the "Ami" part pronounced like "Miami",—and the "Bon" like "Don" and not like bone. As far as we know, most Americans have been pronouncing it that way for fifty years.

* * * * *

Out in Washington, there's a lake which suds up like it had soap in it. It's even called "Soap Lake." And it attracts some 40,000 people yearly because its sudsy waters are reputed to have therapeutic value in treating skin maladies. Anyway, water from the Columbia Basin irrigation project is claimed to be seeping into the lake and those who run the joint are afraid that it will become just another fresh water lake, and they want something done about it quick. Their suds is money in the bank. Maybe they're a customer for soap powder.

* * * * *

Well, sooner or later, it had to happen. The 1956 issue of the "Chemical Peddler," annual funny sheet put out by the Salesmen's Association of the American Chemical Industry for its Christmas Party, has been confiscated and barred from the mails by the Post Office as "lewd and licentious." These were copies recently mailed to each member of SAACI as is the usual custom. And the chief offenders, we hear, were advertisements of some of the largest chemical companies extant. Now, ain't that somethin'!

* * * * *

Thousands of bars of floating soap were dumped into the St. John's River near Jacksonville, Florida, when a freight barge broke in two and sank. Swarms of people in motorboats dipped the bars out of the water with crab nets. Boys along the river banks picked up cakes which floated ashore and did a brisk business at a nickel per bar. It seems the shipping cases burst open when wet releasing the individual soap bars to float merrily on their way. What brand was it? You guessed it—Ivory.

* * * * *

Charley Walker, prez of van Ameringen-Haebler in N. Y. has been somewhat mysterious for years about that middle initial of his, "P." We always figured it might be Phineas, Pierre, Pedro, Pamphilius, or some such. And that he might naturally shy away from announcing it publicly. So at the Essential Oil dinner last month, Charles took down his hair and let us in on the secret. It's "Pittmann." Why he's been hiding it, we don't know. We think he should switch to C. Pittmann Walker. Got a real classy ring to it!

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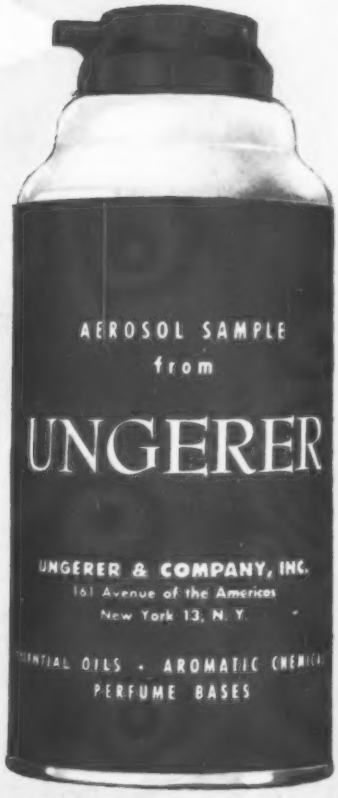

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